



## **QUARTERLY GROUNDWATER MONITORING REPORT**

**Third Quarter 2004 (Ninth Quarterly)**

**Sampled on August 9, 2004**

**Job # SP-120**

**LOP # 12365**

February 21, 2005

**Bigfoot Gas** (Big Oil & Tire - Bigfoot Service Station)  
2801 Central Avenue  
McKinleyville, California 95519

This *Quarterly Groundwater Monitoring Report* was prepared by SounPacific Environmental Services (SounPacific) staff for Big Oil & Tire Co. (BO&T). This report documents the results of the ninth quarterly monitoring event, following the initial sampling conducted after the installation of the site's groundwater monitoring wells. This report includes data from previous studies that were conducted by Clearwater Group, Inc. (CGI) and file review conducted at Humboldt County Department of Health and Human Services: Division of Environmental Health (HCDEH). The station is located at 2801 Central Avenue in McKinleyville, California (Figure 1).

### **SITE DESCRIPTION**

The site is surfaced around the current structure with concrete and asphalt. Site improvements include a single story building with an attached, overhead awning that covers the main dispenser islands. The main structure covers approximately 800 square feet and is positioned near the center of the property with the entrance to the building facing west towards Central Avenue.

Attached to the main structure is a small out building at the north end of the property that is used for storage (Figure 2).

Two (2) 12,000-gallon split compartmented underground storage tanks (USTs) are located in a single excavation between the station and Central Avenue and are used for the storage of three (3) grades of unleaded gasoline and diesel fuel. Fuel is dispensed from two (2) main dispenser islands, which are located under the awning. BO&T owns, operates and is therefore responsible for the maintenance and testing of the product lines and the UST system on a regular basis. The site is serviced by public utilities. Surface water is controlled by drainage ditches and storm drains (Figure 2).

## **SITE TOPOGRAPHY AND LAND USE**

SounPacific understands that the property is currently owned by BO&T of Arcata, California. The main structure is used as a retail gas station for the dispensing of three (3) grades of unleaded gasoline and diesel fuel from the USTs on site. On the north section of the property, a commercial propane tank is stored and used for the filling of smaller propane tanks for the public (Figure 2). The surrounding land use is a mixture of commercial and residential. An automobile garage is located immediately to the south across Murray Road, and properties adjacent to the east, west and north are undeveloped.

The site is approximately two (2) miles east of the Pacific Ocean and approximately 110 feet above mean sea level (MSL). The site is situated approximately 600 feet South of Norton Creek and 1,400 feet North of Widow White Creek. According to the United States Geological Survey Arcata North Quadrangle California-Humboldt County, 7.5 minute series (Topographic) 1959 (photo-revised 1972), a tributary of Norton Creek is re-routed into an underground culvert along the South side of the site. Norton Creek is also artificially controlled along the eastern side of Central Avenue near the site. These two engineered drainage features intersect near the southwestern corner of the property and flow west, toward the Pacific Ocean (Figure 2). It is uncertain if the engineered drainage along the southern and western boundaries of the site will exhibit any hydraulic influence on groundwater flow directly beneath the site. Topography

consists of rolling terrain that gently slopes west toward the Pacific Ocean (Figure 1).

## **RESULTS OF QUARTERLY SAMPLING**

A quarterly groundwater monitoring program was implemented on July 15, 2002, and will continue until further notice. The program consists of recording quarterly water level data and collecting quarterly groundwater samples for laboratory analysis. Water level data is used to develop a figure which displays the groundwater gradient and average flow direction using standard three-point calculations. Analytical results from groundwater samples collected from the monitoring wells during quarterly sampling events present hydrocarbon contamination levels in the groundwater beneath the site. Monitoring wells were gauged and sampled on August 9, 2004.

## **FIELD DATA**

Wells gauged:	MW-1, 2, 3, 4, 5, and 6
Groundwater:	Ranged from 107.86 to 108.45 feet above mean sea level (Table 2)
Floating product:	Sheen detected in monitoring wells MW-3, MW-4, MW-5, and MW-6
Groundwater gradient:	0.005 feet per foot
Flow Direction:	WNW

On August 9, 2004, the depth to groundwater in the site's six monitoring wells ranged from 3.71 feet below ground surface (bgs) in well MW-1 to 5.07 feet bgs in MW-4. When corrected to mean sea-level, water level elevations ranged from 107.86 feet above mean sea-level (amsl) to in MW-1 to 108.45 feet amsl in MW-5. Groundwater levels for the August 9, 2004 monitoring event, along with historical level and elevations are included in Table 1. Groundwater flow on August 9, 2004 was generally flat with a gradient towards the west-northwest at 0.005 feet per foot. The groundwater flow and gradient are graphically depicted in Figure 3. Prior to sampling, all wells were purged; the groundwater field parameters for each well are presented below.

**MONITORING WELL MW-1 GROUNDWATER FIELD PARAMETERS**

<b>Time</b>	<b>Total Vol. Removed/ gal</b>	<b>pH</b>	<b>Temp./ F</b>	<b>Cond./ ms(cm)<sup>-1</sup></b>
<b>7:49</b>	<b>0</b>	<b>7.37</b>	<b>62.99</b>	<b>0.267</b>
<b>7:58</b>	<b>1.25</b>	<b>6.62</b>	<b>59.28</b>	<b>0.241</b>
<b>8:03</b>	<b>2.50</b>	<b>6.69</b>	<b>59.36</b>	<b>0.291</b>
<b>8:06</b>	<b>3.89</b>	<b>6.73</b>	<b>59.21</b>	<b>0.270</b>

**MONITORING WELL MW-2 GROUNDWATER FIELD PARAMETERS**

<b>Time</b>	<b>Total Vol. Removed/ gal</b>	<b>pH</b>	<b>Temp./ F</b>	<b>Cond./ ms(cm)<sup>-1</sup></b>
<b>6:06</b>	<b>0</b>	<b>6.92</b>	<b>59.14</b>	<b>0.777</b>
<b>6:11</b>	<b>1</b>	<b>6.81</b>	<b>58.43</b>	<b>0.741</b>
<b>6:16</b>	<b>2</b>	<b>6.80</b>	<b>58.07</b>	<b>0.655</b>
<b>6:22</b>	<b>3.31</b>	<b>6.80</b>	<b>58.00</b>	<b>0.656</b>

**MONITORING WELL MW-3 GROUNDWATER FIELD PARAMETERS**

<b>Time</b>	<b>Total Vol. Removed/ gal</b>	<b>pH</b>	<b>Temp./ F</b>	<b>Cond./ ms(cm)<sup>-1</sup></b>
<b>7:18</b>	<b>0</b>	<b>7.15</b>	<b>64.82</b>	<b>0.417</b>
<b>7:21</b>	<b>1.25</b>	<b>6.94</b>	<b>63.83</b>	<b>0.524</b>
<b>7:32</b>	<b>2.50</b>	<b>6.87</b>	<b>63.54</b>	<b>0.527</b>
<b>7:35</b>	<b>3.51</b>	<b>6.95</b>	<b>63.43</b>	<b>0.525</b>

**MONITORING WELL MW-4 GROUNDWATER FIELD PARAMETERS**

<b>Time</b>	<b>Total Vol. Removed/ gal</b>	<b>pH</b>	<b>Temp./ F</b>	<b>Cond./ ms(cm)<sup>-1</sup></b>
<b>6:34</b>	<b>0</b>	<b>6.84</b>	<b>70.28</b>	<b>0.661</b>
<b>6:37</b>	<b>1</b>	<b>6.96</b>	<b>67.34</b>	<b>0.613</b>
<b>6:40</b>	<b>2</b>	<b>6.98</b>	<b>66.45</b>	<b>0.582</b>
<b>6:43</b>	<b>3.21</b>	<b>6.97</b>	<b>65.87</b>	<b>0.574</b>

**MONITORING WELL MW-5 GROUNDWATER FIELD PARAMETERS**

<b>Time</b>	<b>Total Vol. Removed/ gal</b>	<b>pH</b>	<b>Temp./ F</b>	<b>Cond./ ms(cm)<sup>-1</sup></b>
<b>5:34</b>	<b>0</b>	<b>7.22</b>	<b>65.70</b>	<b>0.346</b>
<b>5:38</b>	<b>1</b>	<b>6.89</b>	<b>63.05</b>	<b>0.341</b>
<b>5:42</b>	<b>2</b>	<b>6.83</b>	<b>62.82</b>	<b>0.339</b>
<b>5:46</b>	<b>3.45</b>	<b>6.84</b>	<b>62.81</b>	<b>0.337</b>

**MONITORING WELL MW-6 GROUNDWATER FIELD PARAMETERS**

<b>Time</b>	<b>Total Vol. Removed/ gal</b>	<b>pH</b>	<b>Temp./ F</b>	<b>Cond./ ms(cm)<sup>-1</sup></b>
<b>6:54</b>	<b>0</b>	<b>7.17</b>	<b>65.95</b>	<b>0.368</b>
<b>6:58</b>	<b>1</b>	<b>7.05</b>	<b>64.32</b>	<b>0.388</b>
<b>7:01</b>	<b>2</b>	<b>7.05</b>	<b>64.13</b>	<b>0.388</b>
<b>7:05</b>	<b>3.26</b>	<b>7.10</b>	<b>64.08</b>	<b>0.390</b>

## **ANALYTICAL RESULTS**

Sampling locations: MW-1, 2, 3, 4, 5, and 6

Analyses performed: TPHg, BTXE, MTBE, DIPE, TAME, ETBE, TBA, EDC, EDB, TPHd, TPHmo

Laboratories Used: Excelchem Environmental Labs, Arcata, California

The analytical results for the current monitoring event are presented below and graphically depicted in Figure 4. The laboratory report is included as Appendix A. The historical analytical results for all monitoring wells, since the implementation of groundwater monitoring are included as Table 2.

	<u><b>MW-1 (ppb)</b></u>	<u><b>MW-2 (ppb)</b></u>	<u><b>MW-3 (ppb)</b></u>	<u><b>MW-4 (ppb)</b></u>	<u><b>MW-5 (ppb)</b></u>	<u><b>MW-6 (ppb)</b></u>
<b>TPHg:</b>	ND < 50	<b>1,900</b>	<b>970</b>	<b>5,600</b>	<b>37,000</b>	<b>880</b>
<b>Benzene:</b>	ND < 0.5	ND < 5.0	<b>6.0</b>	<b>120</b>	ND < 50	<b>14</b>
<b>Toluene:</b>	ND < 0.5	ND < 5.0	ND < 0.5	<b>44</b>	<b>320</b>	ND < 5.0
<b>Xylenes:</b>	ND < 1.5	ND < 15	ND < 1.5	<b>302</b>	<b>10,000</b>	ND < 15
<b>Ethylbenzene:</b>	ND < 0.5	ND < 5.0	<b>3.6</b>	<b>360</b>	<b>1,100</b>	ND < 5.0
<b>MTBE:</b>	<b>34</b>	<b>2,700</b>	<b>1,500</b>	<b>67</b>	ND < 50	<b>220</b>
<b>DIPE:</b>	ND < 0.5	ND < 5.0	ND < 0.5	ND < 5.0	ND < 50	ND < 0.5
<b>TAME:</b>	<b>1.2</b>	<b>1,100</b>	<b>530</b>	<b>13</b>	ND < 50	<b>16</b>
<b>ETBE:</b>	ND < 0.5	<b>7.2</b>	ND < 0.5	ND < 5.0	ND < 50	ND < 0.5
<b>TBA:</b>	ND < 5.0	<b>730</b>	<b>90</b>	ND < 50	ND < 500	<b>280</b>
<b>EDC:</b>	ND < 0.5	ND < 5.0	<b>1.5</b>	ND < 5.0	ND < 50	ND < 0.5
<b>EDB:</b>	ND < 0.5	ND < 5.0	ND < 0.5	ND < 5.0	ND < 50	ND < 0.5
<b>TPHd:</b>	<b>160</b>	<b>420</b>	<b>250</b>	<b>850</b>	<b>8,500</b>	<b>470</b>
<b>TPHmo:</b>	ND < 500	ND < 500	ND < 500	ND < 500	ND < 500	ND < 500

ND = non-detectable

## **COMMENTS AND RECOMMENDATIONS**

On August 9, 2004, the 9<sup>th</sup> groundwater monitoring event for the six on-site monitoring wells was conducted at the Bigfoot Gas Station at 2801 Central Avenue in McKinleyville, CA. A summary of the results are presented below.

- The depth to groundwater in the six wells ranged between 107.96 and 108.45 feet bgs. Groundwater flow was towards the West-Northwest at a gradient of 0.005 feet per foot.
- Groundwater samples from the six on-site wells were collected and analyzed for TPHg, BTXE, five (5) fuel oxygenates, lead scavengers, TPHd, and TPHmo. Laboratory results reported TPHg in all wells except MW-1 at concentrations ranging from 880 ppb (MW-6) and 37,000 ppb (MW-5). Benzene was reported in wells MW-3, MW-4, and MW-6 at concentrations that ranged from 6.0 ppb (MW-3) to 120 ppb (MW-4). Toluene was reported in wells MW-4 and MW-5 at concentrations of 44 ppb and 320 ppb, respectively. Xylenes were reported in wells MW-4 and MW-5 at concentrations of 302 ppb and 10,000 ppb, respectively. Ethylbenzene was reported in wells MW-3, MW-4, and MW-5 at concentrations ranging from 3.6 ppb (MW-3) to 1,100 ppb (MW-5). Of the fuel oxygenates, MTBE was reported in all wells except MW-5 at concentrations ranging from 37 ppb (MW-1) and 2,700 ppb (MW-2); TAME was reported in all wells except MW-5 at concentrations ranging from 1.2 ppb (MW-1) and 1,100 ppb (MW-2); ethyl tertiary butyl ether was detected in well MW-2 at a concentration of 7.2 ppb; and tertiary butanol was reported in wells MW-2, MW-3, and MW-6 at concentrations that ranged from 90 ppb (MW-3) to 730 ppb (MW-2). The absence of fuel oxygenates in well MW-5, may be the result of elevated reporting limits. No other fuel oxygenates were reported. EDC was detected in MW-3 at a concentration of 1.5 ppb. TPHd was reported in all wells at concentrations ranging from 160 ppb (MW-1) to 8,500 ppb (MW-5). No TPHmo was reported in any of the wells.

Based upon these results the following observations and conclusions have been made.

- Laboratory results have detected generally consistent elevated levels of TPHg in all wells except MW-1 during the monitoring program thus far. TPHg was last detected in MW-1 during the 2<sup>nd</sup> Quarterly sampling event. See Figures 5 through 10.
- BTXE has not been reported in MW-1 since the Well Installation sampling event. BTXE has been reported in wells MW-2 and MW-3 during varying sampling events. BTXE was reported in wells MW-4 and MW-5 during all sampling events to date. BTXE concentrations in wells MW-2 through MW-5 have fluctuated with no apparent decrease. BTXE concentrations have been reported in well MW-6 and appear to be decreasing overall. See Figures 5 through 10.
- MTBE has been reported in wells MW-2 and MW-3 during every sampling event to date. Concentrations fluctuate in the range of  $10^3$  ppb in MW-2 and from  $10^2$  to  $10^3$  ppb in MW-3. MTBE has been reported consistently with varying concentrations in wells MW-1, MW-4, and MW-6, with an overall decreasing trend in concentration in well MW-6. MTBE has not been reported in MW-5 since the 2<sup>nd</sup> Quarterly sampling event (November 2002), however, elevated reporting limits may be masking its presence. See Figures 5 through 10.
- DIPE has not been reported in any wells since the inception of the monitoring program.
- TAME was reported in wells MW-2 and MW-3, and has been consistently reported in these wells since the inception of the monitoring. Concentrations of TAME in these wells have been fluctuating. TAME has been detected in MW-6 during multiple sampling events, with an overall decrease in concentrations. TAME has been reported in MW-1 during multiple sampling events at consistently low concentrations. TAME was reported one time in MW-5, and twice in MW-4.
- ETBE has only been reported twice in well MW-2 since the inception of the monitoring



program.

- TBA was reported infrequently in wells MW-2, MW-3, and MW-6. TBA has not been reported in MW-1, MW-4, or MW-5 thus far.
- TPHd has been reported frequently in wells MW-4, MW-5, and MW-6, with concentrations varying from  $10^2$  to  $10^3$  ppb. TPHd was reported in MW-2 consistently the last five sampling events, and in MW-3 during the last two quarters, but has not appeared there consistently. TPHd was reported in MW-1 the first time this quarter.
- TPHmo has been reported once in MW-5 and MW-6 in the Well Installation and 3<sup>rd</sup> Quarterly sampling events, respectively. TPHmo has not been detected at any other time since the inception of monitoring.
- Lead scavengers as EDC have been reported at low concentrations ( $< 2$  ppb) during multiple events in MW-3, including this quarter. EDC was also reported in MW-6 during the 4<sup>th</sup> Quarter. EDC and EDB were not reported in any other well since the inception of monitoring.

Based on the results of the August 2004 monitoring event and historical results, the following future activities are proposed.

- Groundwater monitoring will be continued until further notice. Groundwater level measurements will be collected from the six on-site monitoring wells to determine groundwater flow direction and gradient. Collected groundwater samples will be analyzed for TPHg, BTXE, five fuel oxygenates, TPHd, TPHmo, and lead scavengers (EDB and EDC).
- SounPacific is currently in the final stage of the preparation of the workplan to delineate the source(s) of soil contamination at the site, as requested in the July 14, 2003, correspondence from HCDEH.

## CERTIFICATION

This report was prepared under the direct supervision of a California registered geologist at SounPacific. All information provided in this report including statements, conclusions and recommendations are based solely upon field observations and analyses performed by a state-certified laboratory. SounPacific is not responsible for laboratory errors.

SounPacific promises to perform all its work in a manner that is currently used by members in similar professions working in the same geographic area. SounPacific will do whatever is reasonable to ensure that data collection is accurate. Please note however, that rain, buried utilities, and other factors can influence groundwater depths, directions and other factors beyond what SounPacific could reasonably determine.

### **SounPacific**

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## **ATTACHMENTS**

### **TABLES & CHART**

- Table 1: Water Levels  
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Chart 1: Hydrograph

### **FIGURES**

- Figure 1: Aerial / Topo Map  
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Figure 10: MW-6 Hydrocarbon Concentrations vs. Time

### **APPENDICES**

- Appendix A: Laboratory Report and Chain-of-Custody Form  
Appendix B: Standard Operating Procedures  
Appendix C: Field Notes

# Tables & Chart

**Table 1**  
**Water Levels**

Bigfoot Gas  
2801 Central Avenue  
McKinleyville, California 95519

Sample Location	Date	Depth to Bottom/ Feet BGS	Survey Height/ Feet Above MSL	Depth to Water/ Feet BGS	Adjusted Elevation/ Feet Above MSL
MW-1	5/1/2002	11.66	111.57	1.54	110.03
	5/30/2002	11.67	111.57	2.43	109.14
	7/3/2002	11.63	111.57	2.65	108.92
	8/3/2002	11.62	111.57	3.40	108.17
	9/4/2002	11.64	111.57	3.90	107.67
	10/4/2002	11.70	111.57	4.25	107.32
	11/4/2002	11.65	111.57	4.36	107.21
	12/2/2002	12.63	111.57	3.61	107.96
	1/6/2003	11.66	111.57	1.22	110.35
	2/5/2003	11.67	111.57	1.31	110.26
	3/7/2003	11.67	111.57	1.67	109.90
	4/8/2003	11.67	111.57	1.00	110.57
	5/12/2003	11.67	111.57	1.32	110.25
	8/2/2003	11.88	111.57	3.11	108.46
	11/8/2003	11.88	111.57	2.57	109.00
	2/5/2004	11.88	111.57	1.21	110.36
	5/4/2004	11.88	111.57	2.03	109.54
	8/9/2004	11.82	111.57	3.71	107.86
MW-2	5/1/2002	12.00	113.03	2.75	110.28
	5/30/2002	11.85	113.03	3.63	109.40
	7/3/2002	11.87	113.03	4.20	108.83
	8/3/2002	11.87	113.03	4.68	108.35
	9/4/2002	11.87	113.03	5.22	107.81
	10/4/2002	9.71	113.03	5.64	107.39
	11/4/2002	11.82	113.03	5.67	107.36
	12/2/2002	11.83	113.03	4.83	108.20
	1/6/2003	11.86	113.03	2.46	110.57
	2/5/2003	10.22	113.03	2.52	110.51
	3/7/2003	11.72	113.03	2.71	110.32
	4/8/2003	11.72	113.03	2.22	110.81
	5/12/2003	11.72	113.03	2.53	110.50
	8/2/2003	11.98	113.03	4.31	108.72
	11/8/2003	11.98	113.03	3.95	109.08
	2/5/2004	11.98	113.03	2.44	110.59
	5/4/2004	11.98	113.03	3.24	109.79
	8/9/2004	11.97	113.03	5.07	107.96

**Table 1 (cont.)**  
**Water Levels**  
 Bigfoot Gas  
 2801 Central Avenue  
 McKinleyville, California 95519

Sample Location	Date	Depth to Bottom/ Feet BGS	Survey Height/ Feet Above MSL	Depth to Water/ Feet BGS	Adjusted Elevation/ Feet Above MSL
MW-3	5/1/2002	11.39	112.13	2.15	109.98
	5/30/2002	11.24	112.13	2.94	109.19
	7/3/2002	11.25	112.13	3.41	108.72
	8/3/2002	11.24	112.13	3.84	108.29
	9/4/2002	11.21	112.13	4.32	107.81
	10/4/2002	11.22	112.13	4.69	107.44
	11/4/2002	11.22	112.13	4.83	107.30
	12/2/2002	11.23	112.13	4.02	108.11
	1/6/2003	11.25	112.13	1.91	110.22
	2/5/2003	11.25	112.13	2.00	110.13
	3/7/2003	11.29	112.13	2.30	109.83
	4/8/2003	11.29	112.13	1.69	110.44
	5/12/2003	11.29	112.13	1.99	110.14
	8/2/2003	11.46	112.13	3.57	108.56
	11/8/2003	11.46	112.13	3.00	109.13
	2/5/2004	11.46	112.13	1.91	110.22
	5/4/2004	11.46	112.13	2.61	109.52
	8/9/2004	11.46	112.13	4.14	107.99
MW-4	5/1/2002	11.34	112.76	2.44	110.32
	5/30/2002	11.14	112.76	3.28	109.48
	7/3/2002	11.11	112.76	3.84	108.92
	8/3/2002	11.14	112.76	4.32	108.44
	9/4/2002	11.12	112.76	4.86	107.90
	10/4/2002	11.12	112.76	5.24	107.52
	11/4/2002	11.05	112.76	5.36	107.40
	12/2/2002	11.08	112.76	4.51	108.25
	1/6/2003	11.05	112.76	2.04	110.72
	2/5/2003	11.06	112.76	2.17	110.59
	3/7/2003	11.24	112.76	2.51	110.25
	4/8/2003	11.24	112.76	1.69	111.07
	5/12/2003	11.24	112.76	3.14	109.62
	8/2/2003	11.32	112.76	4.03	108.73
	11/8/2003	11.32	112.76	3.31	109.45
	2/5/2004	11.32	112.76	2.03	110.73
	5/4/2004	11.32	112.76	2.85	109.91
	8/9/2004	11.32	112.76	4.64	108.12

**Table 1 (cont.)****Water Levels**

Bigfoot Gas  
 2801 Central Avenue  
 McKinleyville, California 95519

Sample Location	Date	Depth to Bottom/ Feet BGS	Survey Height/ Feet Above MSL	Depth to Water/ Feet BGS	Adjusted Elevation/ Feet Above MSL
MW-5	5/1/2002	11.10	112.62	1.43	111.19
	5/30/2002	11.11	112.62	2.71	109.91
	7/3/2002	11.12	112.62	3.31	109.31
	8/3/2002	11.14	112.62	3.85	108.77
	9/4/2002	11.12	112.62	4.37	108.25
	10/4/2002	11.15	112.62	4.85	107.77
	11/4/2002	11.15	112.62	4.97	107.65
	12/2/2002	11.13	112.62	4.02	108.60
	1/6/2003	11.15	112.62	1.11	111.51
	2/5/2003	11.18	112.62	1.23	111.39
	3/7/2003	11.15	112.62	1.70	110.92
	4/8/2003	11.15	112.62	0.95	111.67
	5/12/2003	11.15	112.62	1.33	111.29
	8/2/2003	11.36	112.62	3.53	109.09
	11/8/2003	11.36	112.62	2.67	109.95
	2/5/2004	11.36	112.62	1.10	111.52
	5/4/2004	11.36	112.62	2.18	110.44
	8/9/2004	11.35	112.62	4.17	108.45
MW-6	5/1/2002	10.92	112.38	2.31	110.07
	5/30/2002	10.91	112.38	3.13	109.25
	7/3/2002	10.91	112.38	3.64	108.74
	8/3/2002	10.92	112.38	4.09	108.29
	9/4/2002	10.93	112.38	4.61	107.77
	10/4/2002	10.96	112.38	4.99	107.39
	11/4/2002	10.92	112.38	5.05	107.33
	12/2/2002	10.93	112.38	4.27	108.11
	1/6/2003	10.93	112.38	2.05	110.33
	2/5/2003	10.95	112.38	2.14	110.24
	3/7/2003	10.95	112.38	2.46	109.92
	4/8/2003	10.95	112.38	1.82	110.56
	5/12/2003	10.95	112.38	3.12	109.26
	8/2/2003	11.13	112.38	3.81	108.57
	11/8/2003	11.13	112.38	3.03	109.35
	2/5/2004	11.13	112.38	2.07	110.31
	5/4/2004	11.13	112.38	2.75	109.63
	8/9/2004	11.18	112.38	4.39	107.99

Notes:

Bgs: Below Ground Surface

MSL: Mean Sea Level

**Table 2**  
**Groundwater Analytical Results from Monitoring Wells**  
 Bigfoot Gas  
 2801 Central Avenue  
 McKinleyville, California 95519

Sample Location	Sample Event	Annual Quarter	Sample Date	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Xylenes (ppb)	Ethylbenzene (ppb)	MTBE (ppb)	DIPE (ppb)	TAME (ppb)	ETBE (ppb)	TBA (ppb)	TPHd (ppb)	TPHmo (ppb)	EDC (ppb)	EDB (ppb)
MW-1	Well Installation	2nd Quarter	5/1/2002	ND < 50	ND < 0.3	<b>0.3</b>	ND < 0.6	ND < 0.3	<b>10.5</b>	ND < 0.5	ND < 0.5	ND < 0.5	ND < 100	ND < 50	ND < 50	NT	NT
	1st Quarterly	3rd Quarter	8/3/2002	<b>91</b>	ND < 0.3	ND < 0.3	ND < 0.6	ND < 0.3	<b>114</b>	ND < 0.5	<b>7.5</b>	ND < 0.5	ND < 100	ND < 50	ND < 50	NT	NT
	2nd Quarterly	4th Quarter	11/4/2002	<b>90.4</b>	ND < 0.3	ND < 0.3	ND < 0.6	ND < 0.3	<b>94.7</b>	ND < 0.5	<b>7.6</b>	ND < 0.5	ND < 50	ND < 50	ND < 50	ND < 0.5	ND < 0.5
	3rd Quarterly	1st Quarter	2/5/2003	ND < 50	ND < 0.5	ND < 0.5	ND < 1.0	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5.0	ND < 50	ND < 500	ND < 0.5	ND < 0.5
	4th Quarterly	2nd Quarter	5/12/2003	ND < 50	ND < 0.5	ND < 0.5	ND < 1.0	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5.0	ND < 50	ND < 500	ND < 0.5	ND < 0.5
	5th Quarterly	3rd Quarter	8/2/2003	ND < 50	ND < 0.5	ND < 0.5	ND < 1.0	ND < 0.5	<b>23</b>	ND < 0.5	<b>1.0</b>	ND < 0.5	ND < 5.0	ND < 50	ND < 500	ND < 0.5	ND < 0.5
	6th Quarterly	4th Quarter	11/8/2003	ND < 50	ND < 0.5	ND < 0.5	ND < 1.0	ND < 0.5	<b>88</b>	ND < 0.5	<b>3.5</b>	ND < 0.5	ND < 5.0	ND < 50	ND < 500	ND < 0.5	ND < 0.5
	7th Quarterly	1st Quarter	2/5/2004	ND < 50	ND < 0.5	ND < 0.5	ND < 1.0	ND < 0.5	<b>0.5</b>	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5.0	ND < 50	ND < 500	ND < 0.5	ND < 0.5
	8th Quarterly	2nd Quarter	5/4/2004	ND < 50	ND < 0.5	ND < 0.5	ND < 1.0	ND < 0.5	<b>0.5</b>	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5.0	ND < 50	ND < 500	ND < 0.5	ND < 0.5
	9th Quarterly	3rd Quarter	8/9/2004	ND < 50	ND < 0.5	ND < 0.5	ND < 1.5	ND < 0.5	<b>34.0</b>	ND < 0.5	<b>1.2</b>	ND < 0.5	ND < 5.0	<b>160</b>	ND < 500	ND < 0.5	ND < 0.5
MW-2	Well Installation	2nd Quarter	5/1/2002	<b>498</b>	ND < 0.3	ND < 0.3	<b>3.9</b>	<b>1.3</b>	<b>1,380</b>	ND < 0.5	<b>552</b>	ND < 0.5	ND < 100	ND < 50	ND < 50	NT	NT
	1st Quarterly	3rd Quarter	8/3/2002	<b>8,870</b>	<b>15.7</b>	<b>0.5</b>	<b>3.9</b>	<b>2.2</b>	<b>8,160</b>	ND < 0.5	<b>3,460</b>	ND < 0.5	ND < 100	ND < 50	ND < 50	NT	NT
	2nd Quarterly	4th Quarter	11/4/2002	<b>674</b>	<b>28.3</b>	ND < 0.3	ND < 0.6	ND < 0.3	<b>1,130</b>	ND < 0.5	<b>526</b>	ND < 0.5	ND < 50	ND < 50	ND < 50	ND < 0.5	ND < 0.5
	3rd Quarterly	1st Quarter	2/5/2003	<b>1,200</b>	<b>0.5</b>	ND < 0.5	ND < 1	ND < 0.5	<b>1,900</b>	ND < 0.5	<b>800</b>	<b>4.9</b>	<b>690</b>	ND < 50	ND < 500	ND < 0.5	ND < 0.5
	4th Quarterly	2nd Quarter	5/12/2003	<b>540</b>	ND < 50	ND < 50	ND < 100	ND < 50	<b>730</b>	ND < 50	<b>140</b>	ND < 50	ND < 500	ND < 50	ND < 500	ND < 50	ND < 50
	5th Quarterly	3rd Quarter	8/2/2003	ND < 5,000	ND < 50	ND < 50	ND < 100	ND < 50	<b>1,200</b>	ND < 50	<b>430</b>	ND < 50	ND < 500	<b>140</b>	ND < 500	ND < 50	ND < 50
	6th Quarterly	4th Quarter	11/8/2003	<b>790</b>	ND < 50	ND < 50	ND < 100	ND < 50	<b>4,200</b>	ND < 50	<b>1,800</b>	ND < 50	ND < 500	<b>150</b>	ND < 500	ND < 50	ND < 50
	7th Quarterly	1st Quarter	2/5/2004	<b>440</b>	ND < 50	<b>85</b>	<b>120</b>	ND < 50	<b>1,700</b>	ND < 50	<b>860</b>	ND < 50	ND < 500	<b>93</b>	ND < 500	ND < 50	ND < 50
	8th Quarterly	2nd Quarter	5/4/2004	<b>1,300</b>	ND < 5.0	ND < 5.0	ND < 10.0	ND < 5.0	<b>1,200</b>	ND < 50	<b>530</b>	ND < 50	ND < 500	<b>190</b>	ND < 500	ND < 50	ND < 50
	9th Quarterly	3rd Quarter	8/9/2004	<b>1,900</b>	ND < 5.0	ND < 5.0	ND < 15.0	ND < 5.0	<b>2,700</b>	ND < 5.0	<b>1,100</b>	<b>7.2</b>	<b>730</b>	<b>420</b>	ND < 500	ND < 5.0	ND < 5.0
MW-3	Well Installation	2nd Quarter	5/1/2002	<b>102</b>	<b>2.9</b>	ND < 0.3	<b>5.0</b>	<b>0.8</b>	<b>153</b>	ND < 0.5	<b>46.3</b>	ND < 0.5	ND < 100	ND < 50	ND < 50	NT	NT
	1st Quarterly	3rd Quarter	8/3/2002	<b>8,260</b>	<b>383</b>	<b>145</b>	<b>1,970</b>	<b>420</b>	<b>4,000</b>	ND < 0.5	<b>1,580</b>	ND < 0.5	ND < 100	<b>916</b>	ND < 50	NT	NT
	2nd Quarterly	4th Quarter	11/4/2002	<b>537</b>	<b>30.8</b>	<b>0.7</b>	<b>39.5</b>	<b>24.9</b>	<b>928</b>	ND < 0.5	<b>358</b>	ND < 0.5	ND < 50	ND < 50	ND < 50	ND < 0.5	ND < 0.5
	3rd Quarterly	1st Quarter	2/5/2003	ND < 50	ND < 0.5	ND < 0.5	ND < 1	ND < 0.5	<b>100</b>	ND < 0.5	<b>27</b>	ND < 0.5	<b>17</b>	ND < 50	ND < 500	<b>1.6</b>	ND < 0.5
	4th Quarterly	2nd Quarter	5/12/2003	ND < 50	ND < 0.5	ND < 0.5	ND < 1	ND < 0.5	<b>28</b>	ND < 0.5	<b>5.5</b>	ND < 0.5	ND < 5.0	ND < 50	ND < 500	<b>1.2</b>	ND < 0.5
	5th Quarterly	3rd Quarter	8/2/2003	<b>6,400</b>	<b>75</b>	ND < 5.0	<b>1,000</b>	<b>460</b>	<b>1,200</b>	ND < 5.0	<b>540</b>	ND < 5.0	<b>530</b>	ND < 50	ND < 500	ND < 5.0	ND < 5.0
	6th Quarterly	4th Quarter	11/8/2003	<b>52</b>	ND < 0.5	ND < 0.5	<b>1.2</b>	<b>0.5</b>	<b>120</b>	ND < 0.5	<b>68</b>	ND < 0.5	ND < 5.0	ND < 50	ND < 500	ND < 0.5	ND < 0.5
	7th Quarterly	1st Quarter	2/5/2004	ND < 50	ND < 0.5	ND < 0.5	ND < 1	ND < 0.5	<b>40</b>	ND < 0.5	<b>9.4</b>	ND < 0.5	ND < 5.0	ND < 50	ND < 500	<b>0.9</b>	ND < 0.5
	8th Quarterly	2nd Quarter	5/4/2004	<b>82</b>	ND < 0.5	ND < 0.5	<b>0.5</b>	ND < 0.5	<b>57</b>	ND < 0.5	<b>32</b>	ND < 0.5	ND < 5.0	<b>55</b>	ND < 500	ND < 0.5	ND < 0.5
	9th Quarterly	3rd Quarter	8/9/2004	<b>970</b>	<b>6.0</b>	ND < 0.5	ND < 1.5	<b>3.6</b>	<b>1,500</b>	ND < 0.5	<b>530</b>	ND < 0.5	<b>90</b>	<b>250</b>	ND < 500	<b>1.5</b>	ND < 0.5

TPHg: Total petroleum hydrocarbons as gasoline  
 MTBE: Methyl tertiary butyl ether  
 DIPE: Diisopropyl ether  
 TAME: Tertiary amyl methyl ether  
 TPHd: Total petroleum hydrocarbons as diesel  
 NT: Not tested.

TBA: Tertiary butanol  
 ETBE: Ethyl tertiary butyl ether  
 TPHmo: Total petroleum hydrocarbons as motor oil  
 ppb: parts per billion = µg/l = .001 mg/l = 0.001 ppm.  
 ND: Not detected. Sample was detected at or below the method detection limit as shown.



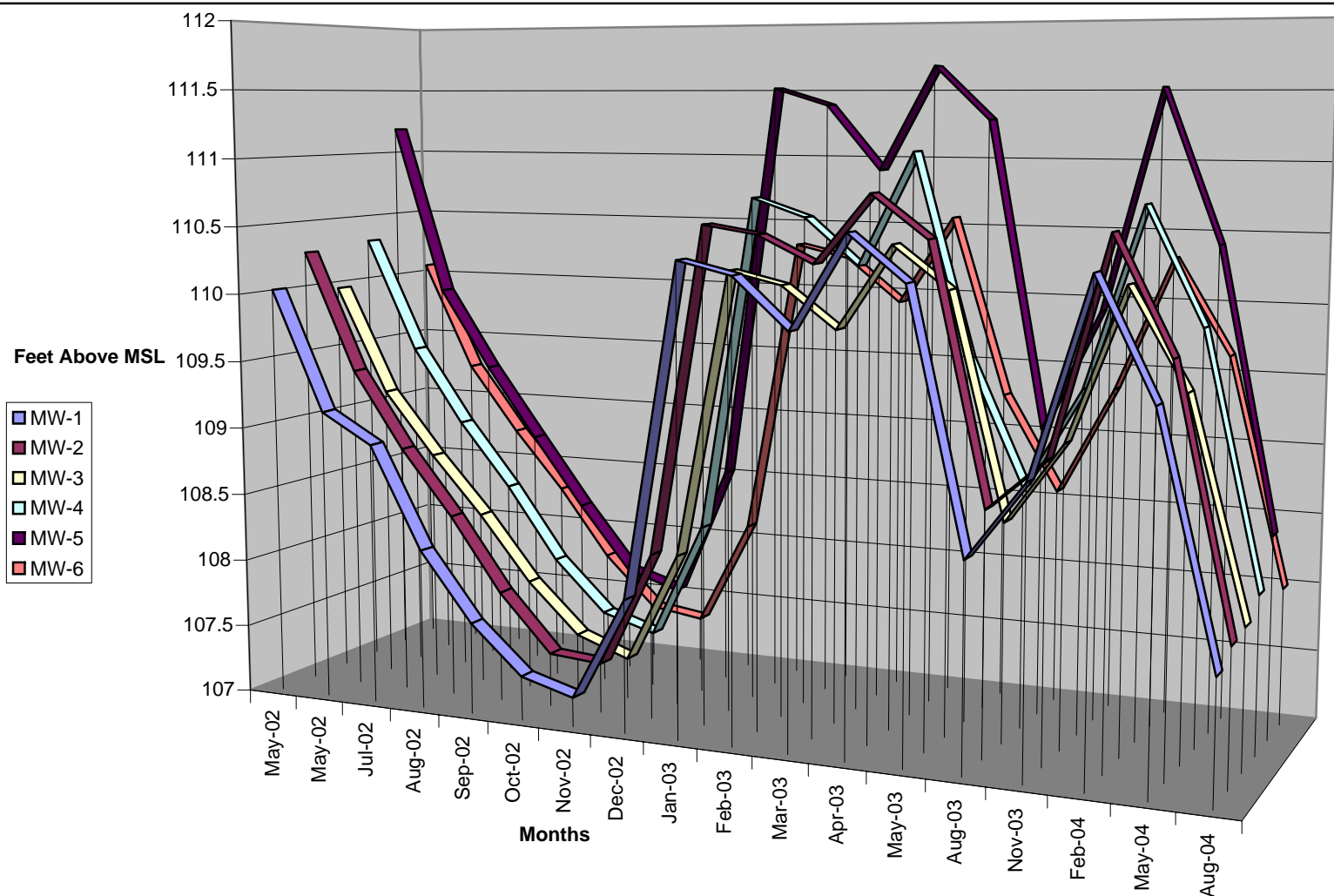
**Table 2 (cont.)**  
**Groundwater Analytical Results from Monitoring Wells**  
 Bigfoot Gas  
 2801 Central Avenue  
 McKinleyville, California 95519

Sample Location	Sample Event	Annual Quarter	Sample Date	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Xylenes (ppb)	Ethylbenzene (ppb)	MTBE (ppb)	DIPE (ppb)	TAME (ppb)	ETBE (ppb)	TBA (ppb)	TPHd (ppb)	TPHmo (ppb)	EDC (ppb)	EDB (ppb)
MW-4	Well Installation	2nd Quarter	5/1/2002	7,970	157	356	1,270	483	ND < 20	ND < 5	ND < 5	ND < 5	ND < 1,000	489	ND < 50	NT	NT
	1st Quarterly	3rd Quarter	8/3/2002	9,150	193	720	2,430	1,080	53	ND < 15	ND < 15	ND < 15	ND < 5,000	2,770	ND < 50	NT	NT
	2nd Quarterly	4th Quarter	11/4/2002	6,090	207	343	712	530	ND < 2.0	ND < 0.5	ND < 0.5	ND < 0.5	ND < 50	159	ND < 50	ND < 0.5	ND < 0.5
	3rd Quarterly	1st Quarter	2/5/2003	20,000	170	120	890	600	ND < 5.0	ND < 5.0	ND < 5.0	ND < 5.0	ND < 50	2,000	ND < 500	ND < 5.0	ND < 5.0
	4th Quarterly	2nd Quarter	5/12/2003	6,200	96	77	248	220	ND < 50	ND < 50	ND < 50	ND < 50	ND < 500	680	ND < 500	ND < 50	ND < 50
	5th Quarterly	3rd Quarter	8/2/2003	7,700	130	59	406	470	31	ND < 5.0	20	ND < 5.0	ND < 50	ND < 50	ND < 500	ND < 5.0	ND < 5.0
	6th Quarterly	4th Quarter	11/8/2003	7,900	260	190	385	480	56	ND < 5.0	ND < 5.0	ND < 5.0	ND < 50	500	ND < 500	ND < 5.0	ND < 5.0
	7th Quarterly	1st Quarter	2/5/2004	7,600	180	110	334	460	29	ND < 5.0	ND < 5.0	ND < 5.0	ND < 50	ND < 50	ND < 500	ND < 5.0	ND < 5.0
	8th Quarterly	2nd Quarter	5/4/2004	8,000	130	140	504	420	19	ND < 5.0	ND < 5.0	ND < 5.0	ND < 50	1,300	ND < 500	ND < 5.0	ND < 5.0
MW-5	9th Quarterly	3rd Quarter	8/9/2004	5,600	120	44	302	360	67	ND < 5.0	13	ND < 5.0	ND < 50	850	ND < 500	ND < 5.0	ND < 5.0
	Well Installation	2nd Quarter	5/1/2002	63,800	ND < 150	1,270	19,500	1,720	ND < 1,000	ND < 250	ND < 250	ND < 250	ND < 50,000	4,420	396	NT	NT
	1st Quarterly	3rd Quarter	8/3/2002	30,500	ND < 15	486	17,700	1,760	ND < 25	ND < 15	ND < 15	ND < 15	ND < 5,000	9,630	ND < 50	NT	NT
	2nd Quarterly	4th Quarter	11/4/2002	81,000	789	ND < 300	24,600	3,710	2,330	ND < 500	1,570	ND < 500	ND < 100,000	3,870	ND < 50	ND < 500	ND < 500
	3rd Quarterly	1st Quarter	2/5/2003	78,000	51	1,600	16,800	1,600	ND < 50	ND < 50	ND < 50	ND < 50	ND < 500	ND < 50	ND < 500	ND < 50	ND < 50
	4th Quarterly	2nd Quarter	5/12/2003	43,000	ND < 50	790	13,400	1,200	ND < 50	ND < 50	ND < 50	ND < 50	ND < 500	4,100	ND < 500	ND < 50	ND < 50
	5th Quarterly	3rd Quarter	8/2/2003	17,000	ND < 50	120	3,890	400	ND < 50	ND < 50	ND < 50	ND < 50	ND < 500	ND < 50	ND < 500	ND < 50	ND < 50
	6th Quarterly	4th Quarter	11/8/2003	43,000	ND < 50	760	16,100	1,500	ND < 50	ND < 50	ND < 50	ND < 50	ND < 500	4,100	ND < 500	ND < 50	ND < 50
	7th Quarterly	1st Quarter	2/5/2004	39,000	50	1,400	22,500	2,000	ND < 50	ND < 50	ND < 50	ND < 50	ND < 500	ND < 50	ND < 500	ND < 50	ND < 50
MW-6	8th Quarterly	2nd Quarter	5/4/2004	54,000	ND < 50	720	12,800	1,300	ND < 50	ND < 50	ND < 50	ND < 50	ND < 500	19,000	ND < 500	ND < 50	ND < 50
	9th Quarterly	3rd Quarter	8/9/2004	37,000	ND < 50	320	10,000	1,100	ND < 50	ND < 50	ND < 50	ND < 50	ND < 500	8,500	ND < 500	ND < 50	ND < 50
	Well Installation	2nd Quarter	5/1/2002	3,750	845	576	1,070	155	980	ND < 0.5	791	ND < 0.5	ND < 100	ND < 50	ND < 50	NT	NT
	1st Quarterly	3rd Quarter	8/3/2002	11,800	508	62	8,630	1,640	750	ND < 15	300	ND < 15	ND < 5,000	1,900	ND < 50	NT	NT
	2nd Quarterly	4th Quarter	11/4/2002	9,480	535	35.2	3,420	743	1,330	ND < 0.5	558	ND < 0.5	ND < 50	190	ND < 50	ND < 0.5	ND < 0.5
	3rd Quarterly	1st Quarter	2/5/2003	4,500	20	ND < 5.0	583	190	ND < 5.0	ND < 5.0	17	ND < 5.0	ND < 50	1,200	ND < 500	ND < 5.0	ND < 5.0
	4th Quarterly	2nd Quarter	5/12/2003	2,200	22	1.2	244	160	68	ND < 0.5	14	ND < 0.5	60	280	ND < 500	0.9	ND < 0.5
	5th Quarterly	3rd Quarter	8/2/2003	ND < 50	ND < 0.5	ND < 0.5	ND < 1.0	ND < 0.5	1	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5.0	ND < 50	2,500	ND < 0.5	ND < 0.5
	6th Quarterly	4th Quarter	11/8/2003	ND < 50	ND < 0.5	ND < 0.5	ND < 1.0	ND < 0.5	1.3	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5.0	ND < 50	ND < 500	ND < 0.5	ND < 0.5
MW-6	7th Quarterly	1st Quarter	2/5/2004	110	4.2	ND < 0.5	ND < 1.0	ND < 0.5	16	ND < 0.5	5.6	ND < 0.5	ND < 5.0	ND < 50	ND < 500	ND < 0.5	ND < 0.5
	8th Quarterly	2nd Quarter	5/4/2004	2,200	25	2.4	200.5	4.0	69	ND < 0.5	17	ND < 0.5	27	590	ND < 500	ND < 0.5	ND < 0.5
	9th Quarterly	3rd Quarter	8/9/2004	880	14	ND < 5.0	ND < 15	ND < 5.0	220	ND < 0.5	16	ND < 0.5	280	470	ND < 500	ND < 0.5	ND < 0.5

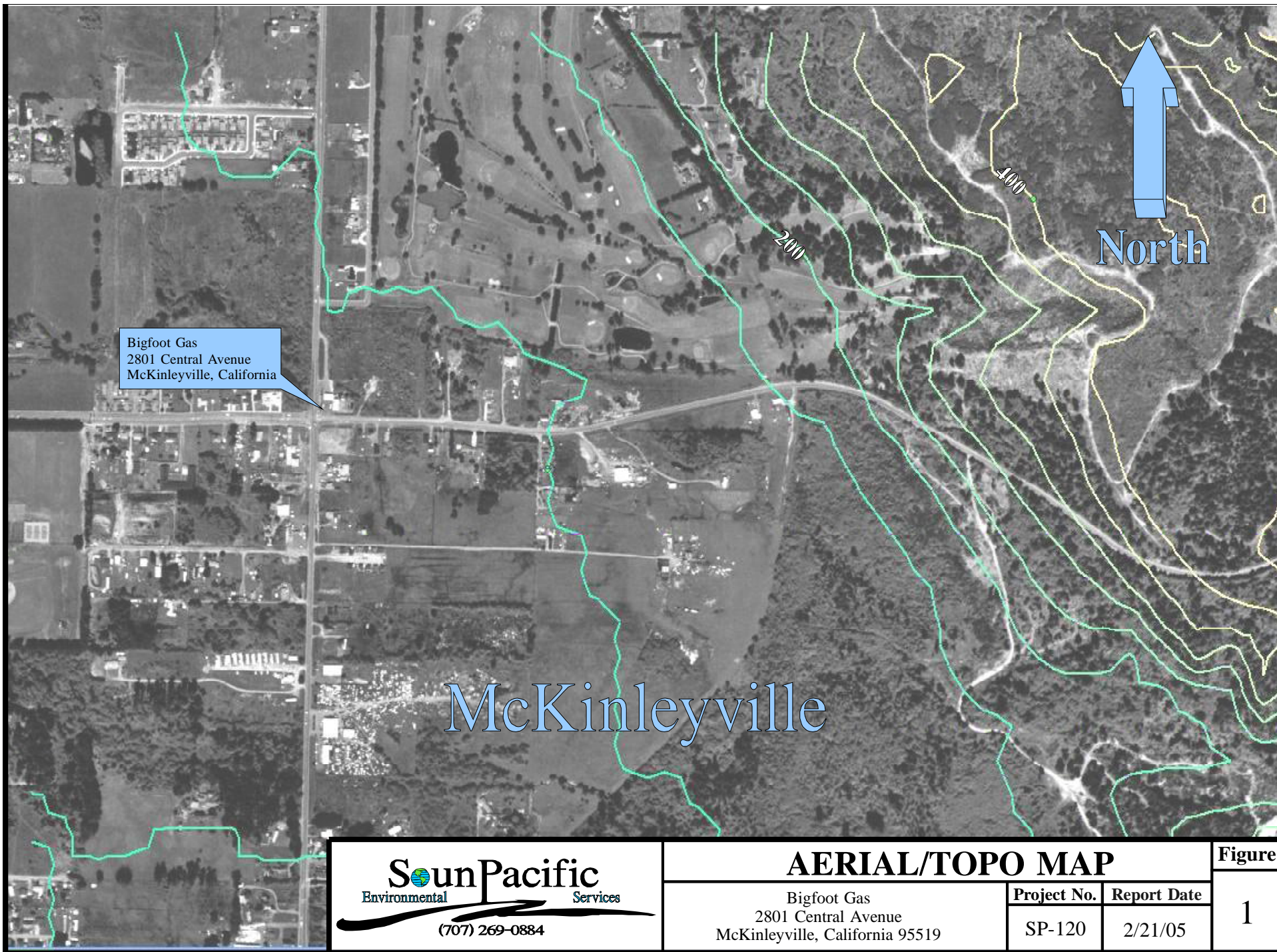
TPHg: Total petroleum hydrocarbons as gasoline  
 MTBE: Methyl tertiary butyl ether  
 DIPE: Diisopropyl ether  
 TAME: Tertiary amyl methyl ether  
 TPHd: Total petroleum hydrocarbons as diesel  
 NT: Not tested.

TBA: Tertiary butanol  
 ETBE: Ethyl tertiary butyl ether  
 TPHmo: Total petroleum hydrocarbons as motor oil  
 ppb: parts per billion = µg/l = .001 mg/l = 0.001 ppm.  
 ND: Not detected. Sample was detected at or below the method detection limit as shown.

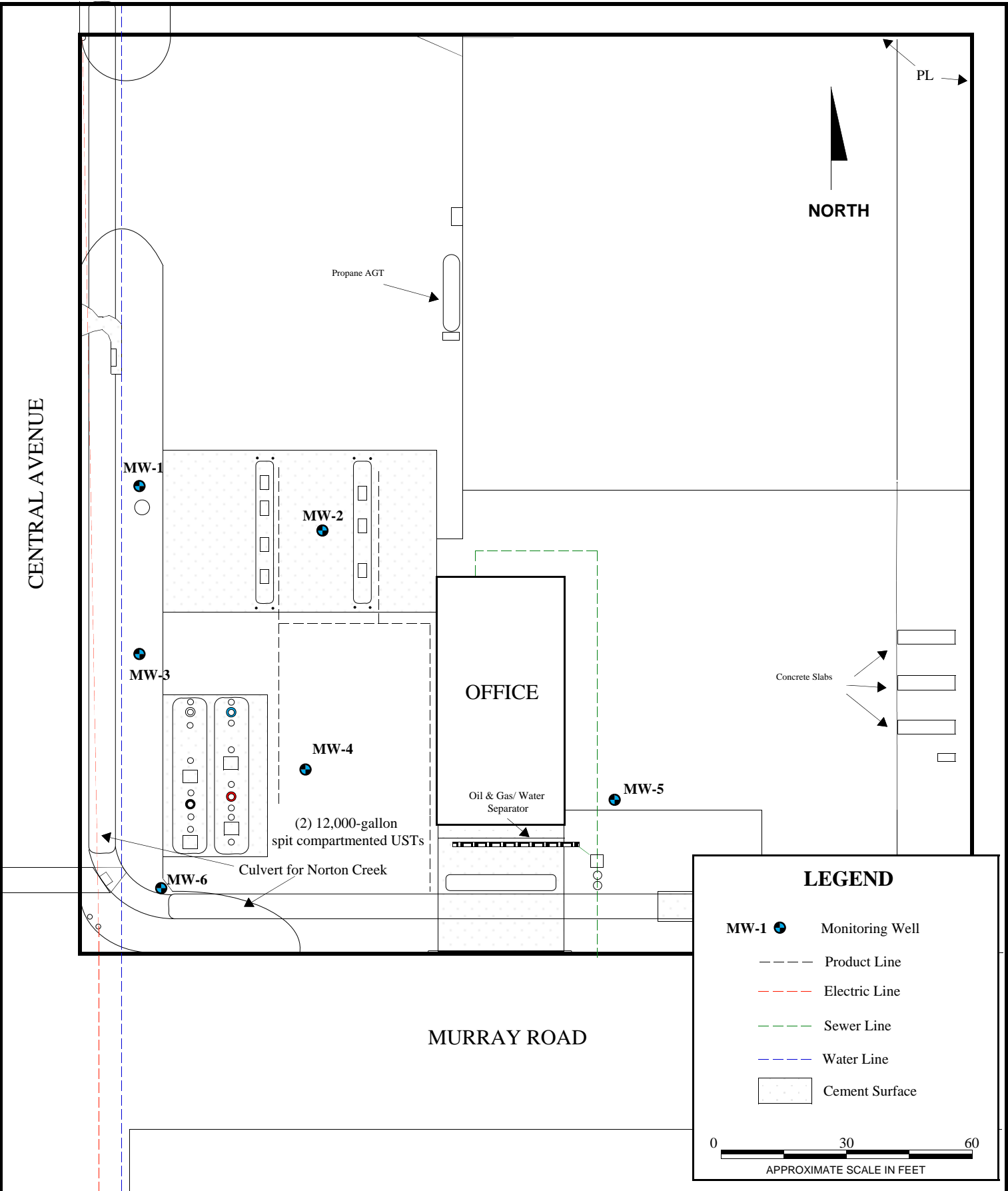
**Chart 1**  
**Hydrograph**  
Bigfoot Gas  
2801 Central Avenue  
McKinleyville, California 95519



# Figures







# **SITE PLAN**

Bigfoot Gas  
2801 Central Avenue  
McKinleyville, California 95519

Project No.  
SP-120

Report Date  
2/21/05

Figure

2

CENTRAL AVENUE

NORTH

Elevation Above  
MSL

PL

**MW1**  
Casing Elevation: 111.57  
Depth to Water: 3.71  
Elevation above MSL: 107.86

**MW-2**  
Casing Elevation: 113.03  
Depth to Water: 5.07  
Elevation above MSL: 107.96

**MW-3**  
Casing Elevation: 112.13  
Depth to Water: 4.14  
Elevation above MSL: 107.99

108.00

108.10

108.20

108.30

108.40

**MW-5**  
Casing Elevation: 112.62  
Depth to Water: 4.17  
Elevation above MSL: 108.45

**MW-6**  
Casing Elevation: 112.38  
Depth to Water: 4.39  
Elevation above MSL: 107.99

**MW-4**  
Casing Elevation: 112.76  
Depth to Water: 4.64  
Elevation above MSL: 108.12

MURRAY ROAD

**GW Flow Direction: NWW**  
**GW Gradient: 0.005 ft/ft**

### LEGEND



Monitoring Well

0 30 60

APPROXIMATE SCALE IN FEET

## GROUNDWATER LEVEL CONTOUR MAP AUGUST 2004

Figure

Bigfoot Gas  
2801 Central Avenue  
McKinleyville, California 95519

Project No.

Report Date

SP-120

2/21/05

3

Environmental

Services

CENTRAL AVENUE

NORTH

PL

Groundwater Results MW-1			
MTBE	34	ppb	
TAME	1.2	ppb	
TPHd	160	ppb	

Groundwater Results MW-2			
TPHg	1,900	ppb	
MTBE	2,700	ppb	
TAME	1,100	ppb	
ETBE	7.2	ppb	
TBA	730	ppb	
TPHd	420	ppb	

Groundwater Results MW-3			
TPHg	970	ppb	
BTXE	9.6	ppb	
MTBE	1,500	ppb	
TAME	530	ppb	
TBA	90	ppb	
TPHd	250	ppb	
EDC	1.5	ppb	

Groundwater Results MW-5			
TPHg	37,000	ppb	
BTXE	11,420	ppb	
TPHd	8,500	ppb	

Groundwater Results MW-4			
TPHg	5,600	ppb	
BTXE	826	ppb	
MTBE	67	ppb	
TAME	13	ppb	
TPHd	850	ppb	

Groundwater Results MW-6			
TPHg	880	ppb	
BTXE	14	ppb	
MTBE	220	ppb	
TAME	16	ppb	
TBA	280	ppb	
TPHd	470	ppb	

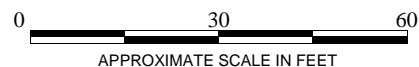
OFFICE

MURRAY ROAD

## LEGEND



Monitoring Well



## GROUNDWATER ANALYTICAL RESULTS

Figure

4

Bigfoot Gas  
2801 Central Avenue  
McKinleyville, California 95519

Project No.

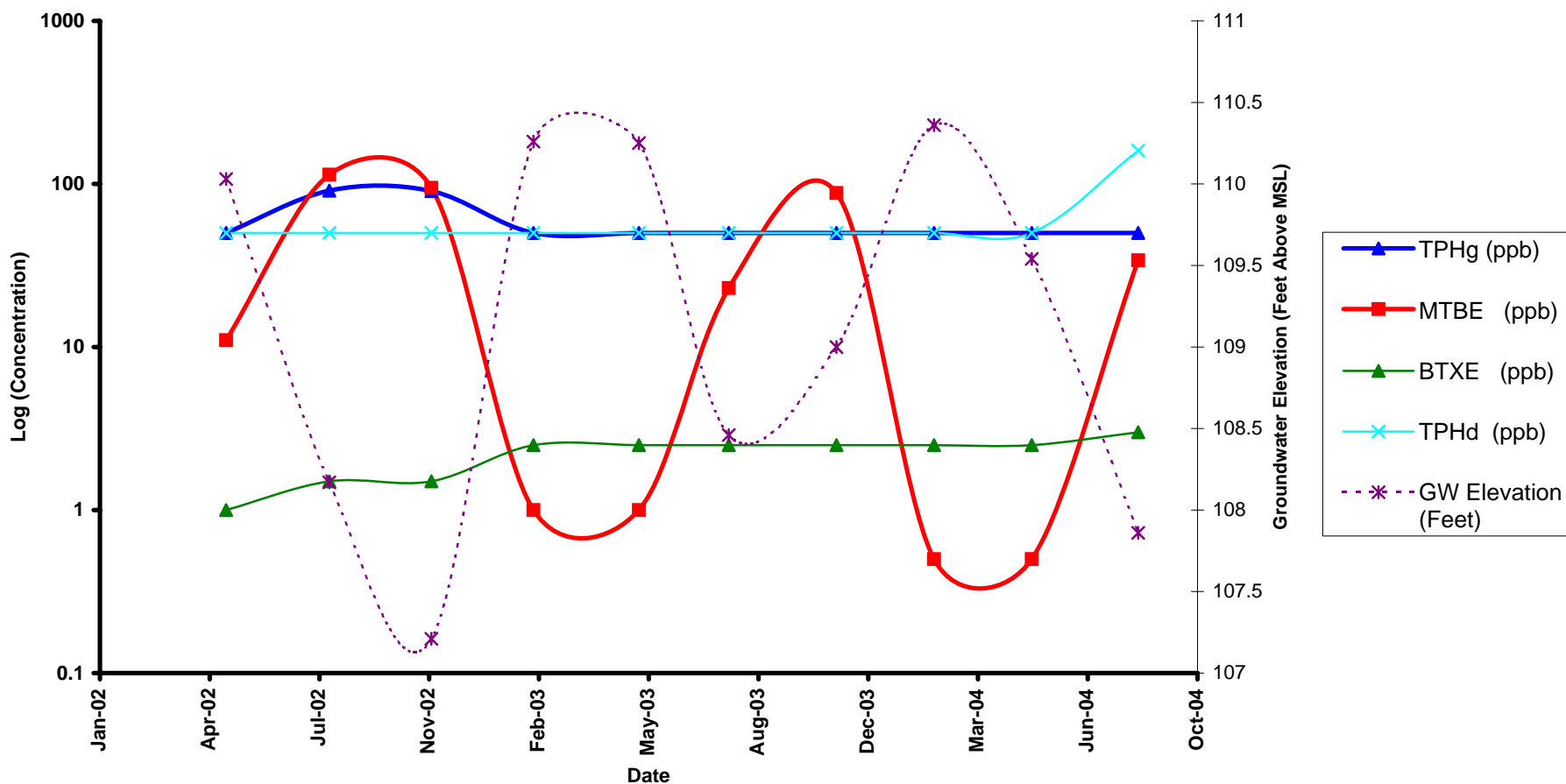
SP-120

Report Date

2/21/05

Environmental

Services

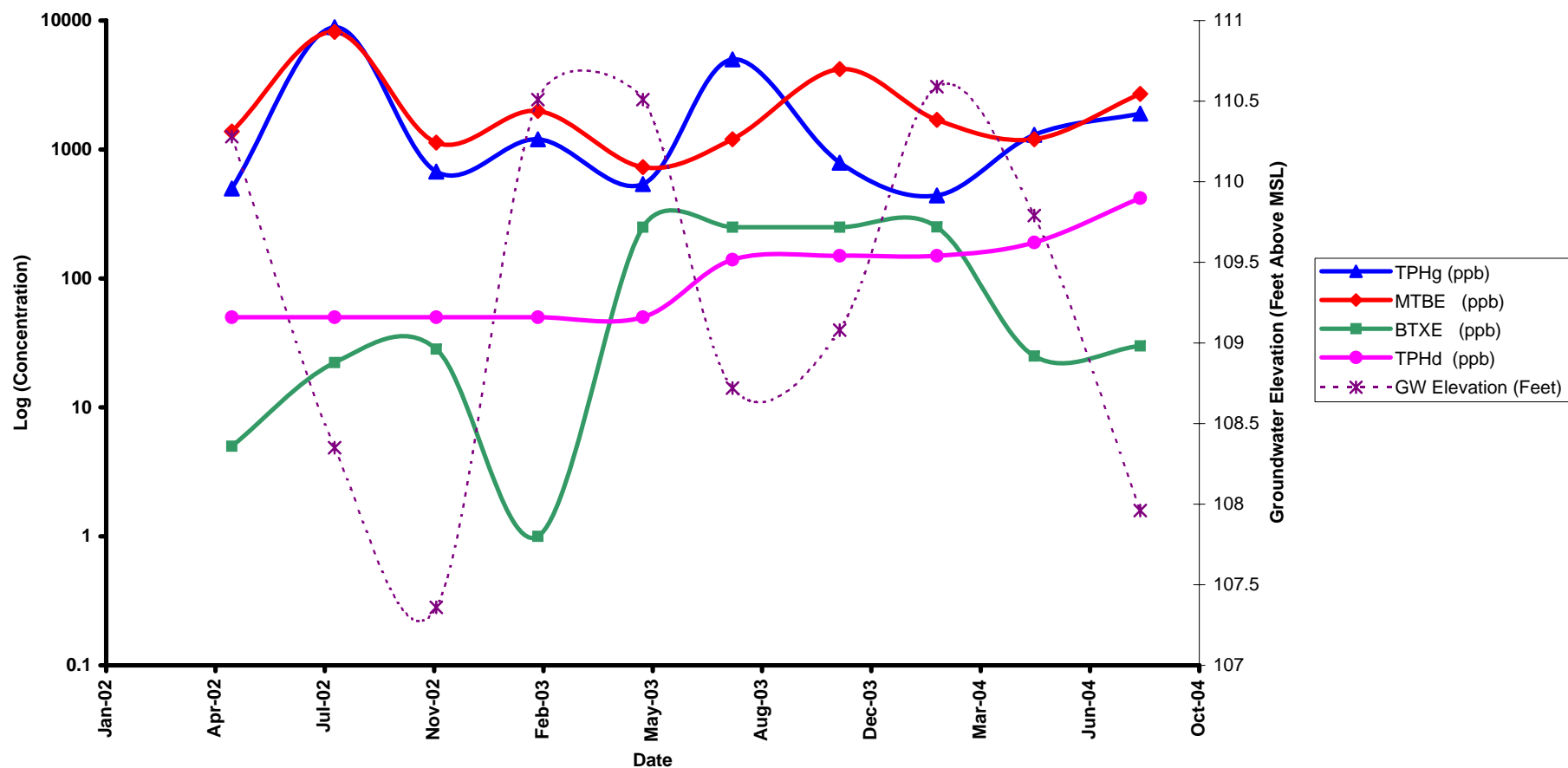


**SounPacific**  
 Environmental Services  
 (707) 269-0884

MW-1 HYDROCARBON CONCENTRATIONS VS. TIME		
Bigfoot Gas 2801 Central Avenue McKinleyville, California 95519	Project No.	Date
	SP-120	2/21/2005

Figure
5





**MW-2 HYDROCARBON  
 CONCENTRATIONS VS. TIME**

Bigfoot Gas  
 2801 Central Avenue  
 McKinleyville, California 95519

Project No.

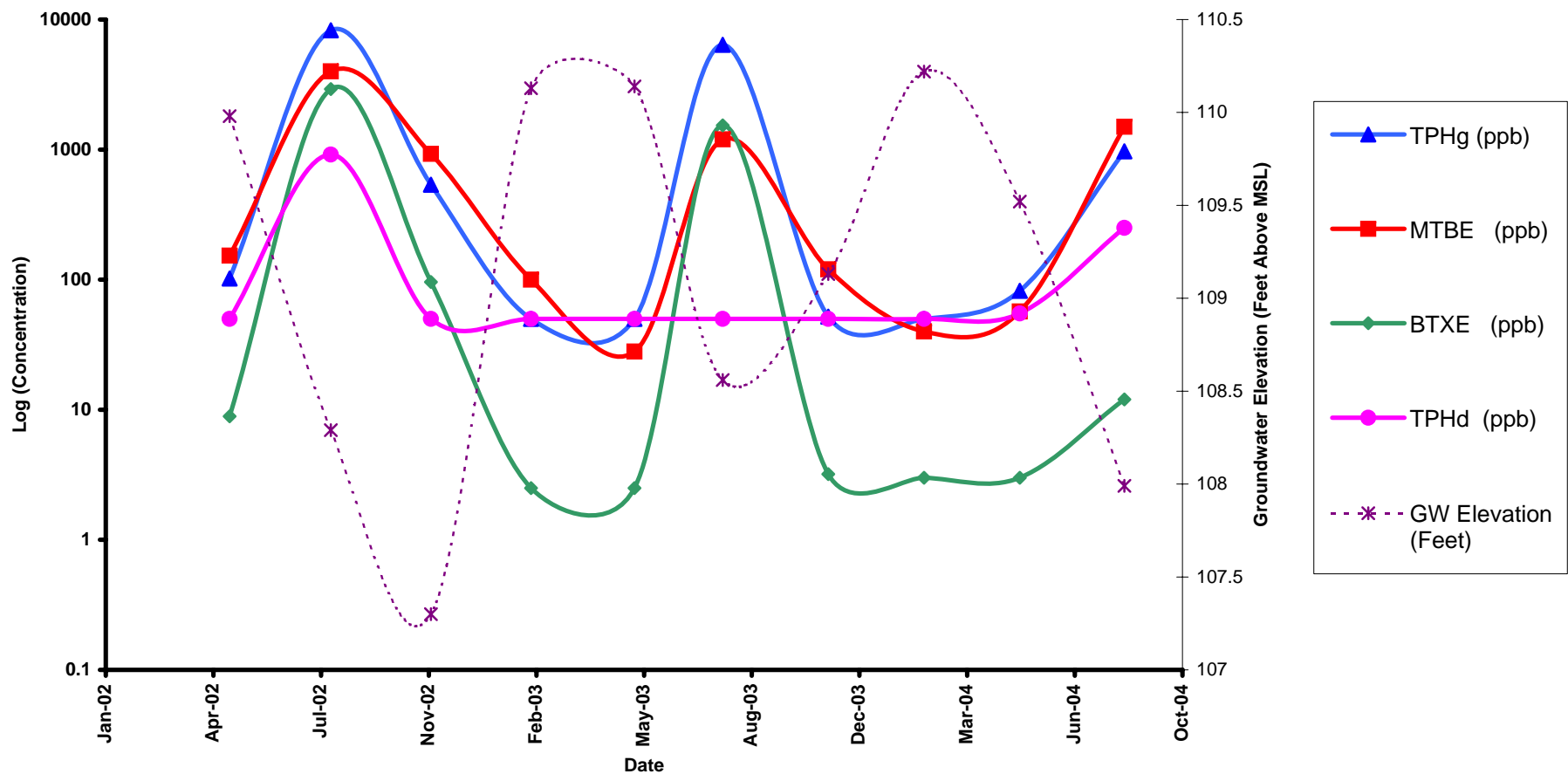
SP-120

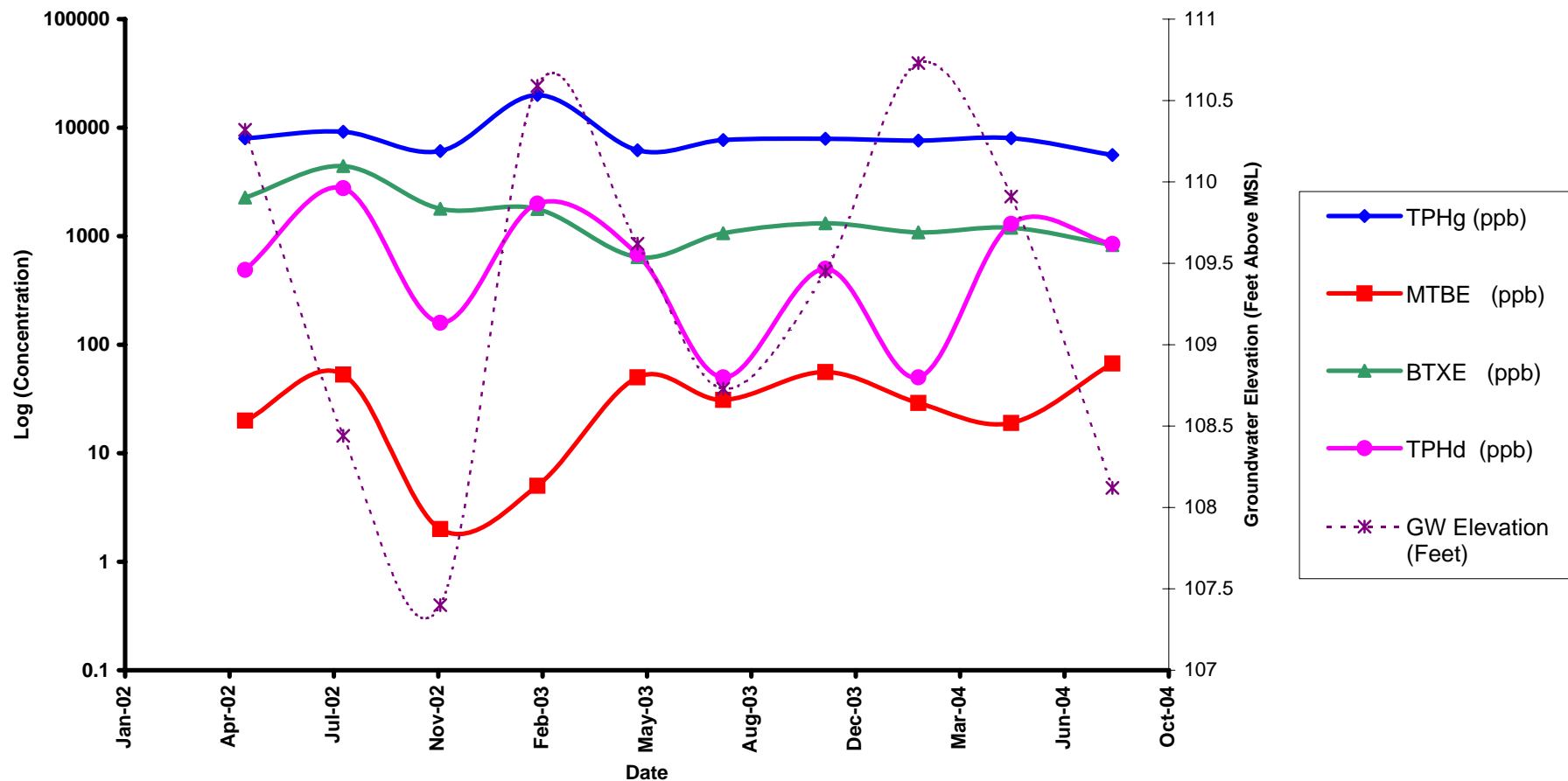
Date

2/21/2005

Figure

6





### MW-4 HYDROCARBON CONCENTRATIONS VS. TIME

Bigfoot Gas  
 2801 Central Avenue  
 McKinleyville, California 95519

Project No.

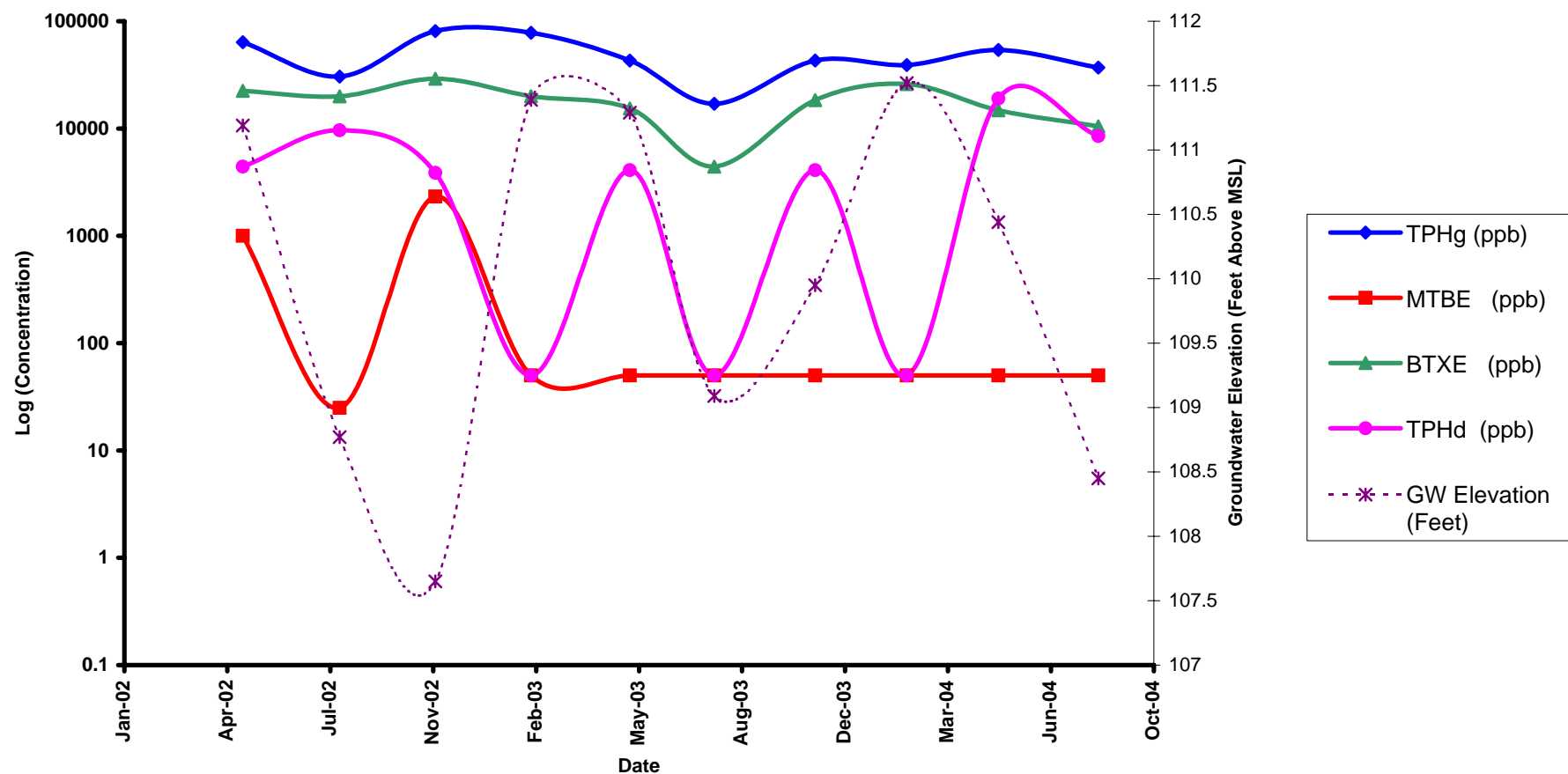
SP-120

Date

2/21/2005

Figure

8



### MW-5 HYDROCARBON CONCENTRATIONS VS. TIME

Bigfoot Gas  
2801 Central Avenue  
McKinleyville, California 95519

Project No.

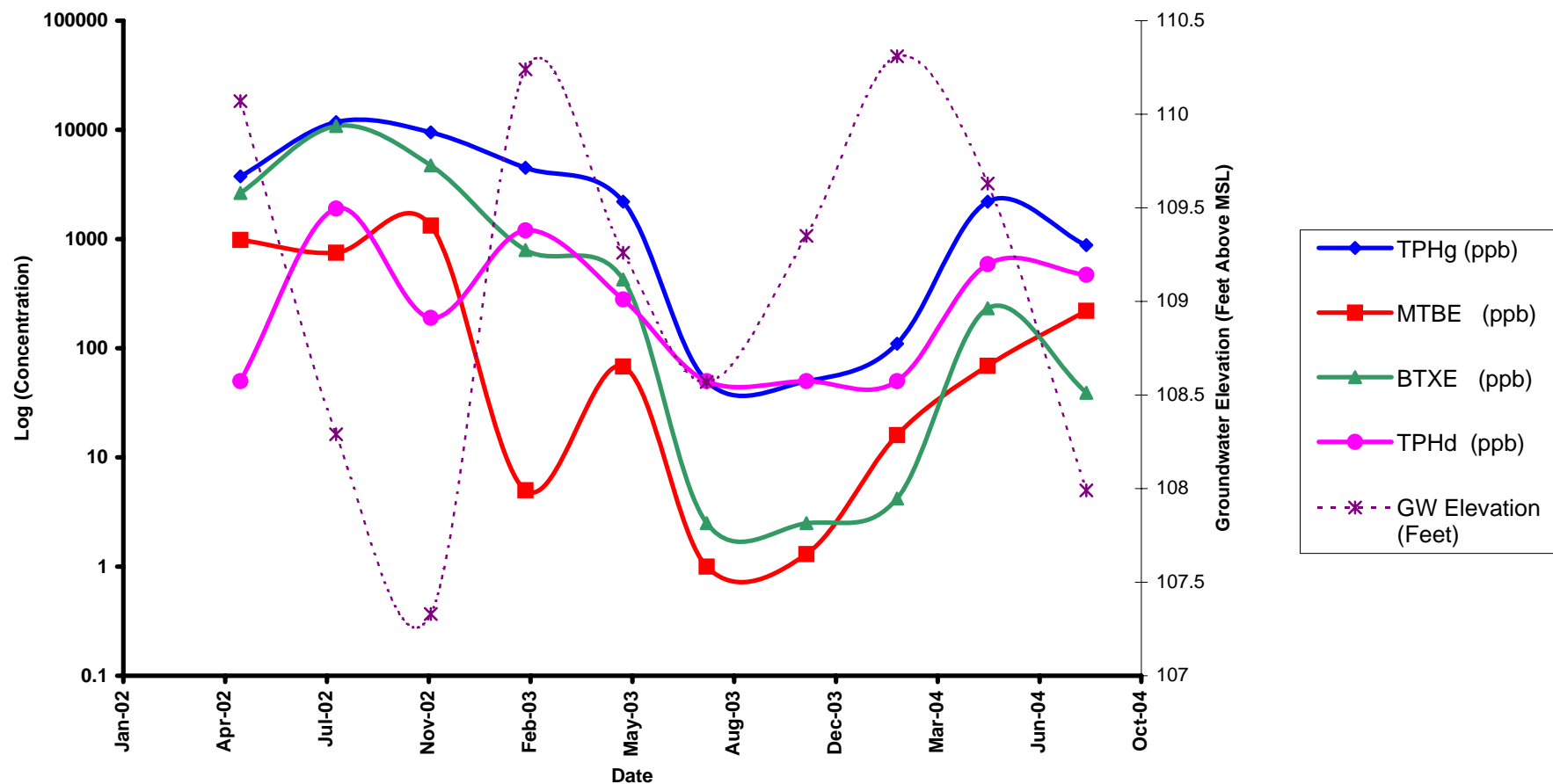
SP-120

Date

2/21/2005

Figure

9



### MW-6 HYDROCARBON CONCENTRATIONS VS. TIME

Bigfoot Gas  
2801 Central Avenue  
McKinleyville, California 95519

Project No.

SP-120

Date

2/21/2005

Figure

10

# Appendices

# **Appendix A**

### ANALYSIS REPORT

Attention: Andy Malone  
 SounPacific Environmental Services  
 P.O. Box 13  
 Kneeland, CA 95549  
 Project: Bigfoot Gas / SP-120  
 Method: EPA 8260B

Date Received: 08/09/04  
 Date Analyzed: 08/12,13/04

Client Sample I.D.	MW-1		MW-2		MW-3		MW-4		MW-5		MW-6	
Date Sampled	08/09/04		08/09/04		08/09/04		08/09/04		08/09/04		08/09/04	
LAB. NO.	W0804237		W0804238		W0804239		W0804240		W0804241		W0804242	
ANALYTE	R/L	Results	R/L	Results	R/L	Results	R/L	Results	R/L	Results	R/L	Results
TPH as Gasoline	50	ND	500	1900	50	970	500	5600	5000	37000	500	880
Benzene	0.5	ND	5.0	ND	0.5	6.0	5.0	120	50	ND	5.0	14
Toluene	0.5	ND	5.0	ND	0.5	ND	5.0	44	50	320	5.0	ND
Ethylbenzene	0.5	ND	5.0	ND	0.5	3.6	5.0	360	50	1100	5.0	ND
m.p-xylene	1.0	ND	10	ND	1.0	ND	10	280	100	8100	10	ND
o-xylene	0.5	ND	5.0	ND	0.5	ND	5.0	22	50	1900	5.0	ND
tert-Butanol	5.0	ND	50	730	5.0	90	50	ND	500	ND	50	280
MTBE	0.5	34	50	2700	50	1500	5.0	67	50	ND	5.0	220
Diisopropyl ether	0.5	ND	5.0	ND	0.5	ND	5.0	ND	50	ND	5.0	ND
Ethyl tert-butyl ether	0.5	ND	5.0	7.2	0.5	ND	5.0	ND	50	ND	5.0	ND
tert-Amyl methyl ether	0.5	1.2	50	1100	50	530	5.0	13	50	ND	5.0	16
1,2-Dichloroethane	0.5	ND	5.0	ND	0.5	1.5	5.0	ND	50	ND	5.0	ND
1,2-Dibromoethane	0.5	ND	5.0	ND	0.5	ND	5.0	ND	50	ND	5.0	ND
SURROGATE %RECOVERY												
Dibromoflouromethane	105		105		100		100		102		100	
Toluene-d8	98		97		99		98		99		97	
4-Bromofluorobenzene	100		97		97		96		95		94	

QA/QC %RECOVERY			
	LCS	MS	MSD
1,1-Dichloroethene	94	90	88
Benzene	92	91	92
Trichloroethene	95	93	91
Toluene	91	90	88
Chlorobenzene	94	95	92

QA/QC Analyzed: 08/12/04

ND = Not detected. Compound(s) may be present at concentrations below the reporting limit.

R/L = Reporting Limit

Water samples reported in µg/L

\_\_\_\_\_  
 Laboratory Representative

08/17/04  
 Date Reported



### ANALYSIS REPORT

Attention: Andy Malone  
SounPacific Environmental Services  
P.O. Box 13  
Kneeland, CA 95549  
Project: Bigfoot Gas / SP-120  
Method: EPA 8015m

Date Received: 08/09/04  
TPHd Analyzed: 08/12/04  
TPHo Analyzed: 08/12/04

Client Sample I.D.	MW-1		MW-2		MW-3		MW-4		MW-5		MW-6	
Date Sampled	08/09/04		08/09/04		08/09/04		08/09/04		08/09/04		08/09/04	
LAB. NO.	W0804237		W0804238		W0804239		W0804240		W0804241		W0804242	
ANALYTE	R/L	Results	R/L	Results	R/L	Results	R/L	Results	R/L	Results	R/L	Results
TPH as Diesel	50	160	50	420	50	250	50	850*	50	8500*	50	470
TPH as Oil	500	ND	500	ND	500	ND	500	ND	500	ND	500	ND

QA/QC %RECOVERY		
	LCS	LCSD
TPH as Diesel	82	83
TPH as Oil	89	102

QA/QC Analyzed: 08/12/04

ND = Not detected. Compound(s) may be present at concentrations below the reporting limit.

R/L = Reporting Limit

Water samples reported in µg/L

\* The sample chromatogram does not match the standard diesel chromatogram.

All peaks were integrated within the diesel range. The result is an estimated value.

\_\_\_\_\_  
Laboratory Representative

08/17/04

Date Reported

70412

<b>Excelchem</b> <b>Environmental Labs</b> Project Manager: <div style="font-size: 1.2em; font-family: cursive;">Andy Malone</div> Company / Address: SounPacific Environmental Services P.O. Box 13 Kneeland, CA 95549		<div style="text-align: center;">300 Broadway Eureka, CA 95501 Ph: 707-444-0120 Fx: 707-444-0560</div> <div style="border: 1px solid black; padding: 5px;"> <b>CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST</b> </div> Electronic Data Deliverables Request: Global I.D. #: <b>70602300275</b> E-mail Address: <b>sounpacific@starband.net</b> COC #: _____      Location I.D. #: <b>andy@malone-innovations.com</b>																																																						
Phone #: 707-269-0884 Fax #: 707-269-0699		<b>ANALYSIS REQUEST</b> <div style="text-align: right;">Page 1 of 1</div>																																																						
Project Name: <div style="font-size: 1.5em; font-family: cursive;">Bigfoot Gas</div>		Project Number / P.O. #: <div style="font-size: 1.5em; font-family: cursive;">SP-120</div>																																																						
Sampling Event: <div style="font-size: 1.2em; font-family: cursive;">"9th Quarterly Event"</div>		Sampler Signature: <div style="font-size: 1.2em; font-family: cursive;">[Signature]</div>																																																						
Sample ID	Date / Time	Sampling VOA SLEEVE IL GLASS PLASTIC	Container HCl HNO <sub>3</sub> ICE Methanol Bisulfate None WATER SOIL AIR	Method Preserved	Matrix	BTEX (602 / 8020) or (8260) CIRCLE ONE TPH as Gas (8160) 8260 TPH as Diesel (8015m) TPH as Oil (8015m) Total Oil & Grease (SM-18b Ed. 5/2008.F) 1664 MTBE (8020) or (8260) CIRCLE ONE Methanol (8015) / Ethanol (8260) 5 Oxygenates (8260) Lead Scavengers (DCA / ED10) (8260B) Closed System Purge & Trap (5030 / 5035) VOC Full List (8260B) Semi-VOC Full List (8270C) CAM 17 Metals Lead CAM 5 (Cd, Cr, Pb, Zn, Ni) PCBs (8082) Pesticides (608 / 8081A)	W.E.T. Total Bin # <div style="font-size: 1.5em; font-family: cursive;">60</div> Due Date: <div style="font-size: 1.2em; font-family: cursive;">08/17/04</div>																																																	
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Sample ID</th> <th>Date / Time</th> <th>Sampling</th> <th>Container</th> <th>Method Preserved</th> <th>Matrix</th> </tr> </thead> <tbody> <tr> <td>MW-1</td> <td>8-9-04</td> <td>2</td> <td>2</td> <td>2</td> <td>X X X X</td> </tr> <tr> <td>MW-2</td> <td>↓</td> <td>↓</td> <td>↓</td> <td>↓</td> <td>↓ ↓ ↓ ↓</td> </tr> <tr> <td>MW-3</td> <td>↓</td> <td>↓</td> <td>↓</td> <td>↓</td> <td>↓ ↓ ↓ ↓</td> </tr> <tr> <td>MW-4</td> <td>↓</td> <td>↓</td> <td>↓</td> <td>↓</td> <td>↓ ↓ ↓ ↓</td> </tr> <tr> <td>MW-5</td> <td>↓</td> <td>↓</td> <td>↓</td> <td>↓</td> <td>↓ ↓ ↓ ↓</td> </tr> <tr> <td>MW-6</td> <td>↓</td> <td>↓</td> <td>↓</td> <td>↓</td> <td>↓ ↓ ↓ ↓</td> </tr> </tbody> </table> </div> <div style="width: 45%;"> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>LAB USE ONLY:</th> </tr> </thead> <tbody> <tr> <td>X W0804237</td> </tr> <tr> <td>W0804238</td> </tr> <tr> <td>W0804239</td> </tr> <tr> <td>W0804240</td> </tr> <tr> <td>W0804241</td> </tr> <tr> <td>W0804242</td> </tr> </tbody> </table> </div> </div>								Sample ID	Date / Time	Sampling	Container	Method Preserved	Matrix	MW-1	8-9-04	2	2	2	X X X X	MW-2	↓	↓	↓	↓	↓ ↓ ↓ ↓	MW-3	↓	↓	↓	↓	↓ ↓ ↓ ↓	MW-4	↓	↓	↓	↓	↓ ↓ ↓ ↓	MW-5	↓	↓	↓	↓	↓ ↓ ↓ ↓	MW-6	↓	↓	↓	↓	↓ ↓ ↓ ↓	LAB USE ONLY:	X W0804237	W0804238	W0804239	W0804240	W0804241	W0804242
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Relinquished by: <div style="font-size: 1.2em; font-family: cursive;">[Signature]</div>		Date Time 8-10-04		Received by: <div style="font-size: 1.2em; font-family: cursive;">Robert [Signature]</div>		Remarks / Condition of Sample: (Please e-mail COELT and results to e-mail address(es), no faxes.)																																																		
Relinquished by: <div style="font-size: 1.2em; font-family: cursive;">[Signature]</div>		Date Time 08/11/04 8:00a		Received by Laboratory: <div style="font-size: 1.2em; font-family: cursive;">S. [Signature]</div>		Bill To: <div style="font-size: 1.5em; font-family: cursive;">Soun Pacific</div>																																																		

## **Appendix B**



# **Standard Operating Procedures**

## **Groundwater Level Measurements and Free Phase Hydrocarbon Measurements**

All SounPacific staff and contractors shall adopt the following procedures any time that groundwater elevations are determined for the purposes of establishing groundwater gradient and direction, and prior to any sampling event.

Wells are to be tested for free phase hydrocarbons (free product) before the first development or sampling of any new well, and in any well that has historically contained free product.

### **Equipment Checklist**

- ☐ Combination water level / free phase hydrocarbon indicator probe (probe)
- ☐ Gauging Data / Purge Calculations Sheet
- ☐ Pencil or Pen/sharpie
- ☐ Disposable Gloves
- ☐ Distilled Water and or know water source on site that is clean
- ☐ Alconox (powder) or Liquinox (liquid) non-phosphate cleaners—do not use soap!
- ☐ Buckets or Tubs for decontamination station
- ☐ Tools necessary to access wells
- ☐ Site Safety Plan
- ☐ This Standard Operating Procedure
- ☐ Notify Job site business that you will be arriving to conduct work.

### **Procedure**

1. Review Site Safety Plan and utilize personal protection appropriate for the contaminants that may be encountered.
2. Access and open all monitoring wells to be measured. Allow wells to equilibrate for approximately 15 minutes before taking any measurements.

3. Decontaminate probe with Alconox or Liquinox solution, and rinse with distilled water.
4. Determine the diameter of the well to be measured and indicate this on the Gauging Data / Purge Calculations Sheet.
5. Words of caution: Please be careful with water level and product meters probes are not attached with high strength material so please make sure to avoid catching the end on anything in the well and make sure not to wind reel to the point that it could pull on the probe. ***If product is suspect in a well, go to step 6, if no product is suspected go to step 7 below.***
6. **When product is present or suspected:** use the product level meter. Clip the static charge clamp to the side of the well casing. Then lower probe into the well through the product/water interface about one foot if possible. Then slowly raise the probe back up through the product/water interface layer and record the level as the tone changes from solid to broken-record this level in the Gauging Data / Purge Calculations Sheet to the nearest 0.01 foot (DTP). Continue to raise the probe up through the product until the tone stops completely-record this level on the Gauging Data / Purge Calculations Sheet to the nearest 0.01 foot (DTW). Then go to step 8.
7. **When no product is present or suspected:** If no free product is present, record the depth of the water (to the nearest 0.01 foot) relative to the painted black mark on the top of the well casing. Leave the probe in the well just a hair above the water level to ensure the well as equilibrated. As the well rises, the tone will sound. Make sure no increase in water levels have occurred in over a ten-minute period. Water levels can lower as well as rise. Make sure you note when the level you keep lowering the probe to has remained stable for at least ten minutes. Once this has been accomplished, please record this level in the Gauging Data / Purge Calculations Sheet to the nearest 0.01 foot (DTW).
8. Turn off the probe, and use the probe to determine the depth to the bottom of the well relative to the top of the well casing. This is the depth to bottom measurement (DTB).
9. Decontaminate probe and tape by washing in an Alconox/Liquinox solution (***read directions on solution for ratio of water to cleanser***) and use the toothbrush provided to remove any foreign substance from the probe and tape. Then triple rinse probe and tape with clean water and then proceed to take measurements in the next well.
10. If sampling is to occur, proceed to implement SounPacific's Standard Operating Procedure for Monitoring Well Purging and Sampling. If no sampling is to be performed, close and secure all wells and caps.



## Standard Operating Procedures

### Monitoring Well Purging and Groundwater Sampling

All SounPacific employees and contractors shall adopt the following procedures any time that groundwater samples are to be taken from an existing groundwater monitoring well.

Prior to the implementation of these procedures, the groundwater level **MUST** be measured and the presence of free phase hydrocarbons determined in accordance with SounPacific's Standard Operating Procedures for Groundwater Level Measurements and Free Phase Hydrocarbon Measurements.

### Equipment Checklist

- ☐ **Gauging Data / Purge Calculations Sheet used for water level determination**
- ☐ Chain of Custody Form
- ☐ pH/ Conductivity / Temperature meter
- ☐ Pencil or Pen
- ☐ Indelible Marker
- ☐ Calculator
- ☐ Disposable Gloves
- ☐ Distilled Water
- ☐ Alconox/liquinox liquid or powdered non-phosphate cleaner
- ☐ Buckets or Tubs for decontamination station
- ☐ Bottom-filling bailer or pumping device for purging
- ☐ Disposable bottom-filling bailer and emptying device for sampling
- ☐ String, twine or fishing line for bailers
- ☐ Sample containers appropriate for intended analytical method (check with lab)
- ☐ Sample labels
- ☐ Site Safety Plan
- ☐ Tools necessary to access wells
- ☐ Drum space on site adequate for sampling event

### **Procedure**

1. Review Site Safety Plan and utilize personal protection appropriate for the contaminants that may be encountered.
2. Measure groundwater levels and check for the presence of free product in accordance with the Standard Operating Procedures for Groundwater Level Measurements and Free Phase Hydrocarbon Measurements.

### **Purging**

3. Calculate and record the volume of standing water in each well using the information provided on the Gauging Data / Purge Calculations sheet.  
 $(DTB-DTW) \times \text{Conversion Factor} = \text{Casing Volume}.$
4. The purge volume shall be at least three times and no more than seven times the volume of standing water (the casing volume).
5. Purge the well by bailing or pumping water from the well into a calibrated receptacle, such as a five gallon bucket or tub with markings to indicate one gallon increments. Collect purgeate in a 55 gallon labeled drum and store on site. Drum labels should include the date, contents, site number, and SounPacific's name and telephone number.
6. Take measurements of pH, conductivity, temperature, and visual observations to verify the stabilization of these parameters. At least five measurements of these parameters should be made throughout the purging process. The parameters shall be considered stabilized if successive measurements vary by less than 0.25 pH units, 10% of conductivity in  $\mu\text{S}$ , and  $1^{\circ}\text{C}$  (or  $1.8^{\circ}\text{F}$ ). Continue purging until at least three times the casing volume has been removed, and the measured parameters have stabilized as indicated above. Do not exceed seven casing volumes.
7. Take a final depth to groundwater measurement and calculate the casing volume of the recharged well. Ideally, the casing volume should have recharged to at least 80% of the original measured casing volume before sampling commences. If due to slow recharge rates it is not feasible to wait for the well to fully recharge, then note this on the Gauging Data / Purge Calculation Sheet and proceed to sample following the procedure below.

## **Sampling**

8. **After completing groundwater measurement, and checking for free product if necessary, in accordance with SounPacific's Standard Operating Procedures for Groundwater Level Measurements and Free Phase Hydrocarbon Measurements, and after purging monitoring wells as described above, groundwater samples may be collected.**
9. Slowly lower a clean, previously unused disposable bailer into the well water approximately half of the bailer length, and allow the bailer to slowly fill.
10. Withdraw the full bailer from the monitoring well and utilize the included (clean and unused) bottom-emptying device to fill the necessary sample containers, and seal the container with the included PTFE (Teflon) lined cap.
11. When filling VOAs, fill the VOA completely full, with the meniscus rising above the rim of the bottle. Carefully cap the VOA and invert it and gently tap it to determine whether air bubbles are trapped inside. If the VOA contains air bubbles, refill the VOA and repeat this step.
12. All samples shall be labeled with the Sample ID, the Sample Date, and the Sample Location or Project Number. Use an indelible marker for writing on sample labels.
13. Record all pertinent sample data on the Chain of Custody.
14. Place samples in an ice chest cooled to 4°C with ice or "blue ice". Bottles should be wrapped in bubble wrap, and VOA's should be inserted in a foam VOA holder to protect against breakage. Samples are to be kept at 4°C until delivered to the laboratory. Any transference of sample custody shall be indicated on the Chain of Custody with the appropriate signatures as necessary.
15. Utilize clean, previously unused gloves, bailer and line, and bottom-emptying device for each well sampled.
16. When finished with all sampling, close and secure all monitoring wells.
17. Leave the site cleaner than when you arrived and drive safely.



# **Appendix C**

## GAUGING DATA/PURGE CALCULATIONS

Job Site: Bigfoot Gas  
 Event: "9th Quarterly Event"

Job No.: SP-120  
 Date: 8-9-04

**Soun Pacific**  
 Environmental Services  
 (707) 269-0884

Well NO	DIA. (in.)	DTB (ft.)	DTW (ft.)	ST (ft.)	CV (gal.)	PV (gal.)	SPL (ft.)	Boiler Loads	Notes
MW-1	2	11.82	3.71	8.11	1.30	3.84			no sheen detected
MW-2	2	11.97	5.07	6.90	1.10	3.31			no sheen detected
MW-3	2	11.46	4.14	7.32	1.17	3.51			sheen detected
MW-4	2	11.32	4.64	6.68	1.07	3.21			sheen detected
MW-5	2	11.35	4.17	7.18	1.15	3.45			sheen detected
MW-6	2	11.18	4.34	6.79	1.09	3.26			sheen detected

## Explanation:

DIA. = Well Diameter

DTB = Depth to Bottom

DTW = Depth to Water

ST = Saturated Thickness (DTB-DTW)

CV = Casing Volume (ST x cf)

PV = Purge Volume (standard 3 x CV;  
well development 10 x CV)

SPL = Thickness of Separate Phase Liquid

## Conversion Factors (cf):

2 in. dia. well cf = 0.16 gal. ft.

4 in. dia. well cf = 0.65 gal. ft.

6 in. dia. well cf = 1.44 gal. ft.

Sampler:

Andy Malone

Bigfoot Gas



# Well Gauging/Sampling Report

Sheet 1 of 6

Date: 8-9-04 Project Name: Bigfoot Gas Project No: SP-120 Well Number: mw-1

Analyses Tested: TPHg, BTXE, 5-oxyg, TPHd, TPHmo, Pb scavengers

Sample Containers: (2) HCl vials, (2) 1-L amber bottles

Purge Technique: ☒ Bailor ☐ Pump

Sounder Used: ☐ Water Meter ☒ Interface Meter

## Water & Free Product Levels

Time	Depth to Water	Depth to Product	Notes:
4:49	3.70		no sheen detected
5:06	3.71		no sheen detected

## Field Measurements

Time	Total Vol. Removed (gal)	pH	Temp (F)	Cond. (ns/cm)	DO (mg/l.)	DO (%)	
7:49	0	7.37	62.99	0.267	0.69	7.2	
7:58	1.25	6.62	59.28	0.241	0.19	1.8	
8:03	2.50	6.69	59.36	0.241	0.31	3.1	
8:06	3.89	6.73	59.21	0.270	0.32	3.2	

Field Scientist:

Andy Malone



# Well Gauging/Sampling Report

Sheet 2 of 6

Date: 8-9-04 Project Name: Bigfoot Gas Project No: 9-120 Well Number: MW-2

Analyses Tested: TPHg, BTXE, 5-oxy, TPHd, TPHmo, Pb scavengers

Sample Containers: (2) HCl Vials, (2) 1-L amber bottles

Purge Technique: ☒ Bailor ☐ Pump

Sounder Used: ☐ Water Meter ☒ Interface Meter

## Water & Free Product Levels

Time	Depth to Water	Depth to Product	Notes
4:46	5.06		no sheen detected
5:03	5.07		no sheen detected

## Field Measurements

Time	Total Vol. Removed (gal)	pH	Temp (F)	Cond. (ms/cm)	TOC (mg/l)	DO (%)	
6:06	0	6.92	59.14	0.777	0.46	43.5	
6:11	1	6.81	58.43	0.741	0.49	4.9	
6:16	2	6.80	58.07	0.655	0.28	2.7	
6:22	3.31	6.80	58.00	0.656	0.18	1.8	

Field Scientist:

Andy Malone





# Well Gauging/Sampling Report

Sheet 3 of 6

Date: 8-9-04 Project Name: Bigfoot Gas Project No: SP120 Well Number: MW-3

Analyses Tested: TPH<sub>g</sub>, BTXE, 5-OX<sub>g</sub>, TPH<sub>h</sub>, TPH<sub>m</sub>, Ab scavengers

Sample Containers: (2) HCL VOAS, (2) 1-L amber bottles

Purge Technique: ☒ Bailor ☐ Pump

Sounder Used: ☐ Water Meter ☒ Interface Meter

## Water & Free Product Levels

Time	Depth to Water	Depth to Product	Notes
4:51	4.14		no sheen detected sheen detected
5:09	4.14		

## Field Measurements

Time	Total Vol. Removed (gal)	pH	Temp (°F)	Cond. (µm/cm)	DO (mg/L)	DO (%)	
7:18	0	7.15	64.82	0.417	0.88	9.3	
7:21	1.25	6.94	63.83	0.524	0.30	3.2	
7:32	2.50	6.87	63.54	0.527	0.15	1.6	
7:35	3.51	6.95	63.43	0.525	0.22	2.3	

Field Scientist:

Andy Malone



# Well Gauging/Sampling Report

Sheet 4 of 6

Date: 8-9-04 Project Name: Bigfoot Gas Project No: SP-120 Well Number: MW-4

Analyses Tested: TPHg, BTxE, 5-oxyg, TPHd, TPHmo, Pb scavengers

Sample Containers: (2) HCl WAS, (2) HL amber bottles

Purge Technique: ☒ Bailor ☐ Purge

Sounder Used: ☐ Water Meter ☒ Interface Meter

## Water & Free Product Levels

Time	Depth to Water	Depth to Product	Notes
4:54	4.64		sheen detected
5:12	4.64		no sheen detected

## Field Measurements

Time	Total Vol. Removed (gal)	pH	Temp (F)	Cond. (mc/cm)	DO (mg/L)	DO (%)	
6:34	0	6.84	70.28	0.661	0.73	8.3	
6:37	1	6.96	67.34	0.613	0.32	3.5	
6:40	2	6.98	66.45	0.582	0.23	2.5	
6:43	3.21	6.97	65.87	0.574	0.23	2.4	

Field Scientist:

Andy Malone

Sheet 5 of 6

Project Name:

## Bigfoot Gas

Project No.

SP-120

Well Number

MW-5

Analyses Tested: TPH<sub>g</sub>, BTXE, 5-OX<sub>g</sub>, TPH<sub>d</sub>, TPH<sub>no</sub>

Sample Containers: (2) HCl VOAS, (2) 1-L amber bottles

Forge Technique;	Halter
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☐ *Pismo*

Sounder ☐ Water Meter

 Interface  
Meter

Time	Depth to Water	Depth to Product	Notes:
4.44	4.16		shoen detected
5:00	4.17		shoen detected

Time	Total Vol Removal (gal)	pH	Temp (F)	Cond (µm/cm)	DO (mg/L)	DO (%)	
5:34	0	7.22	65.70	0.346	1.37	14.7	
5:38	1	6.89	63.05	0.341	0.32	3.3	
5:42	2	6.83	62.82	0.339	0.21	2.2	
5:46	3.45	6.84	62.8	0.337	0.17	1.7	

Field Scientist:

Andy Malone





# Well Gauging/Sampling Report

Sheet 6 of 6

Date: 8-9-04 Project Name: Bigfoot Gas Project No: SP-120 Well Number: MW-6

Analyses Tested: TPHg, BTxE, 5-oxys, TPHd, TPHmo, Pb scavengers

Sample Containers: (2) HCl vials, (2) 1-L amber bottles

Purge Technique: ☒ Bailor ☐ Pump  
 Sounder Used: ☐ Water Meter ☒ Interface Meter

## Water & Free Product Levels

Time	Depth to Water	Depth to Product	Notes
4:56	4.39		sheen detected
5:16	4.39		sheen detected

## Field Measurements

Time	Total Vol Removed (gal)	pH	Temp (F)	Cond (ms/cm)	DO (mg/L)	DO (%)	
6:54	0	7.17	65.45	0.368	1.83	19.7	
6:58	1	7.05	64.32	0.388	0.43	4.6	
7:01	2	7.05	64.13	0.388	0.28	3.0	
7:05	3.26	7.10	64.06	0.390	0.54	5.7	

Field Scientist: Andy Malone